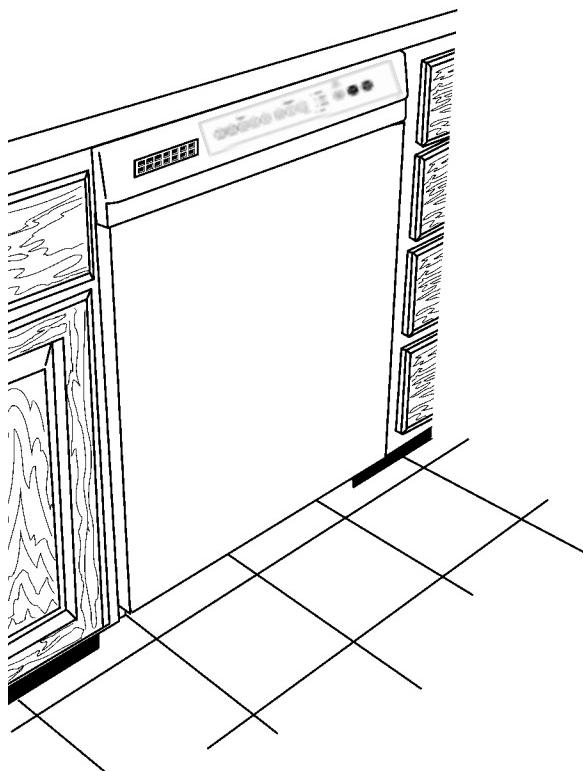




CONSUMER SERVICES TECHNICAL
EDUCATION GROUP PRESENTS

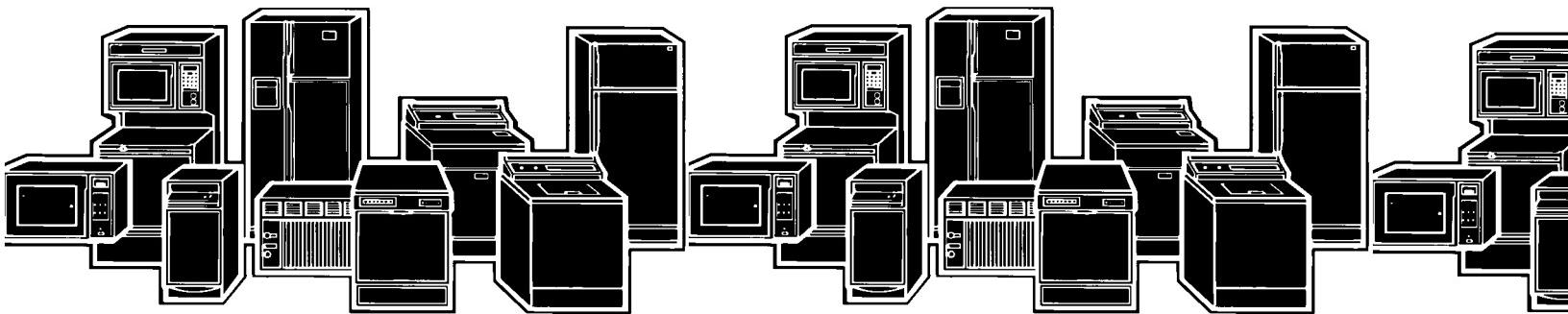
KD-12

POINT VOYAGER DISHWASHER



MODEL NUMBERS:
GU1200XT
GU1500XT

JOB AID
Part No. 8178022



INTRODUCTION

This Job Aid, *POINT VOYAGER DISHWASHER*, Part No. 8178022 provides specific information on the operation, diagnosis and repair of the Whirlpool Point Voyager series Undercounter Dishwasher.

POINT VOYAGER DISHWASHER has been compiled to provide the most recent information on design, features, operation, troubleshooting, and repair procedures.

GOALS AND OBJECTIVES

The goal of this Job Aid is to provide detailed information that will enable the service technician to properly diagnose malfunctions and repair the Point Voyager dishwasher.

The objectives of the Job Aid are:

The service technician will -

- Understand proper safety precautions.
- Successfully troubleshoot and diagnose malfunctions.
- Successfully perform necessary repairs.
- Successfully return the dishwasher to proper operational status.

WHIRLPOOL CORPORATION ASSUMES NO RESPONSIBILITY
FOR ANY REPAIRS MADE ON OUR PRODUCTS BY ANYONE
OTHER THAN AUTHORIZED SERVICE TECHNICIANS.

TABLE OF CONTENTS

MODEL/SERIAL NUMBER DESIGNATOR	iv
Section One	
INSTALLATION CONSIDERATIONS	1
GENERAL CONSIDERATIONS	1
S P E C I F I C A T I O N S	-
2	
Section Two	
THEORY OF OPERATION	3
CONTROL PANEL	3
Model: GU1200XTK	
Cycle Selection Chart	3
Option Selection	5
Cycle Status Indicators	6
CONTROL PANEL	7
Model: GU1500XTK	
Cycle Selection Chart	7
FUNCTION DESCRIPTION	9
Section Three	
COMPONENT ACCESS	13
COMPONENT LOCATION	13
ACCESSING COMPONENTS IN THE DOOR	14
ACCESSING COMPONENTS INSIDE THE TUB	17
ACCESSING COMPONENTS OF THE PUMP ASSEMBLY	20
SERVICING THE DOOR HINGE	23
Section Four	
TROUBLESHOOTING AND DIAGNOSIS	25
TROUBLESHOOTING CHART	25
COMMON CYCLE TIME CHART	26
HOW TO USE COMMON CYCLE TIME	28
COMMON CYCLE TIME CHART NOTES	31
DIAGNOSTIC CYCLE TIME CHART	35
RAPID ADVANCE FEATURE & DIAGNOSTIC CYCLES	36
Section Five	
TECH TIPS	37
WIRING DIAGRAM	37
MODEL SPECIFIC SERVICE PARTS TABLE	38
USER INTERFACE SWITCH MATRIX	38
STRIP CIRCUITS	39
ELECTRONIC CONTROL CONNECTOR PINS	40

MODEL/SERIAL NUMBER PLATE

SERIAL NUMBER DESIGNATOR

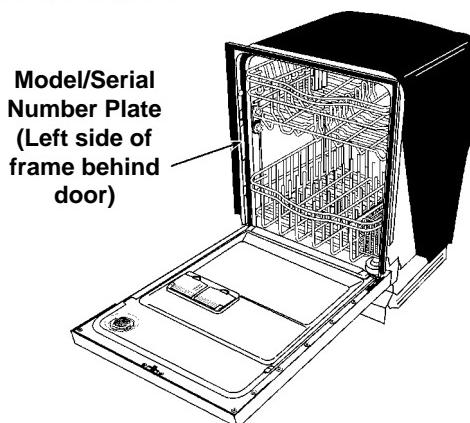
SERIAL NUMBER **F L 36 50001**

MANUFACTURING SITE
F = Findlay, OH

YEAR OF MANUFACTURE
L = 2001

WEEK OF MANUFACTURE

PRODUCT SEQUENCE NUMBER



MODEL NUMBER DESIGNATOR

MODEL NUMBER **G U 1500 XT K B 0**

Product Group
G = Gold Series Dishwasher

Product Identification
U = Undercounter

Series Code
800 = Baseline and Contract Models
900 = Midline and Retail Derivatives
1000 = Voyager Platform

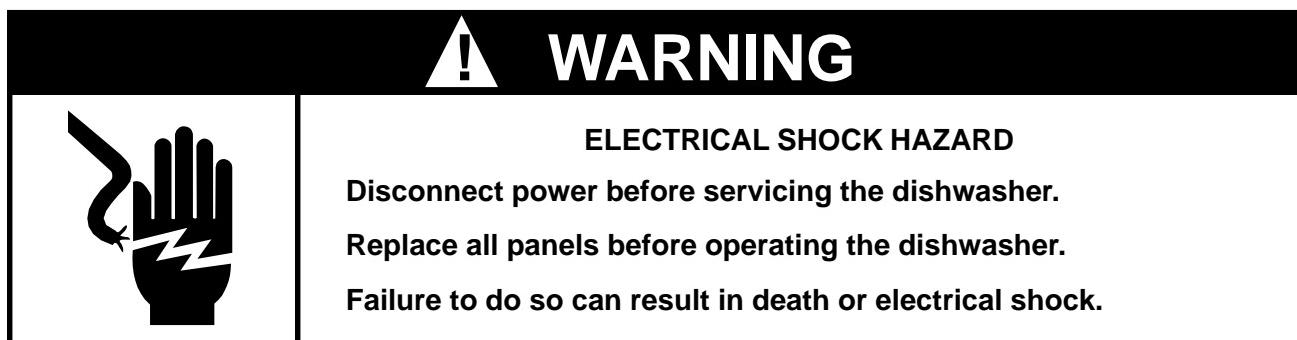
Feature Code
PW = Premium Wash System
SW = Standard Wash System
XT = Extra Tall Tub

Year of Introduction
K = 2001

Color Code
B = Black Monochromatic
Q = White Monochromatic
T = Bisquit Monochromatic w/frameless panel
S = Black Console w/Stainless Steel panel

ENGINEERING CHANGE
0 = Basic Release; 1 = First Revision; 2 = Second Revision

SAFETY



SECTION ONE

INSTALLATION CONSIDERATIONS

GENERAL CONSIDERATIONS

For complete installation procedures see the “Installation Instructions” in the literature packet provided with the dishwasher.

A video presentation, *Key Features and Installation Considerations*, part number 4317280V, is available. This video covers the entire installation process.

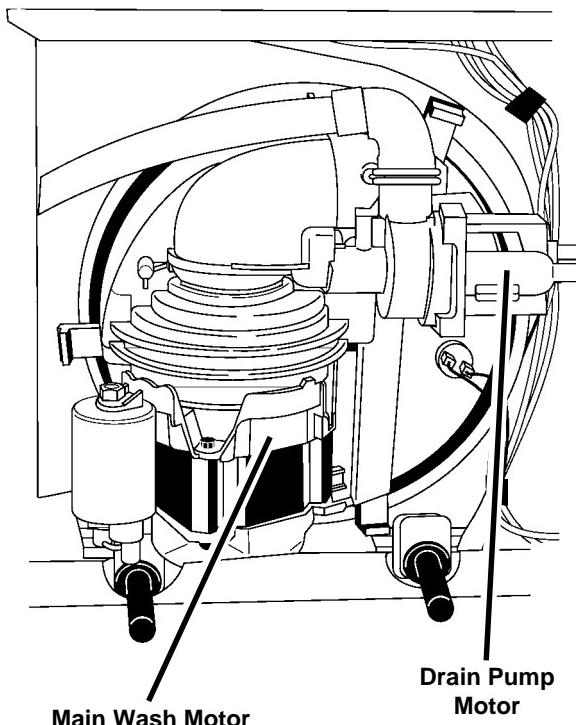
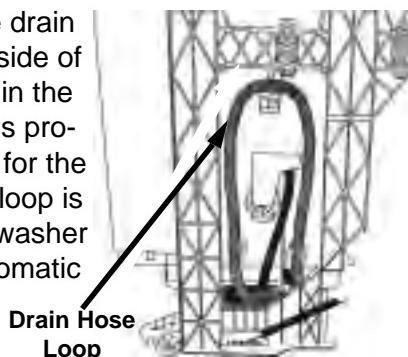
Each location will present a different set of challenges that can be anticipated and solved before installation begins.

- Check the planned location of the dishwasher.
- Easy access to hot water, drain line and electricity.
- Convenient access for loading. The dishwasher door should open and close freely.
- The opening under the counter should be square and the cabinet fronts should be perpendicular to the floor.
- Make sure the cabinet opening is free of intrusions such as braces or utility lines.
- Do not install the dishwasher on carpeted floors.
- An outside wall behind the dishwasher should be insulated to prevent the water line, inlet valve and drain line from rupturing.

The application of a horizontal pump and filter technology allows for the tub to be designed three inches deeper than current models. This deeper tub and longer door design will impact the installation process because there is less working space available underneath the unit and correct routing and placement of the drain hose, water supply and electrical wiring is critical.

The tub must be level. Reduced water consumption of this dishwasher requires that it be installed level and plumb for proper water recirculation back into the sump area during operation.

Do not remove the drain hose from the left side of the tub. This loop in the drain hose provides proper back pressure for the soil sensor. If the loop is removed, the dishwasher will not initiate Automatic Purge Filtration.



View of Sump Assembly from Underneath
Showing Horizontal Wash Pump Motor
and Drain Pump Motor

SPECIFICATIONS

ELECTRICAL SUPPLY: (Under Load) 60Hz, 120VAC

SUPPLY WATER FLOW RATE: (To Fill 2 Quarts (1.9 L) in 27 secs.) - 120psi Max., 20psi Min.

SUPPLY WATER TEMPERATURE: 120° F to 160° F (49° C to 71° C)

WATER CHARGE: 1.8 Gal. (6.8 L) / First Fill
 1.7 Gal. (6.5 L) / All Other Fills

LOWER SPRAY ARM ROTATION: 25 TO 40 RPM

UPPER SPRAY ARM ROTATION: 25 TO 35 RPM

APF DRAIN: .1 Gal. (.38 L)

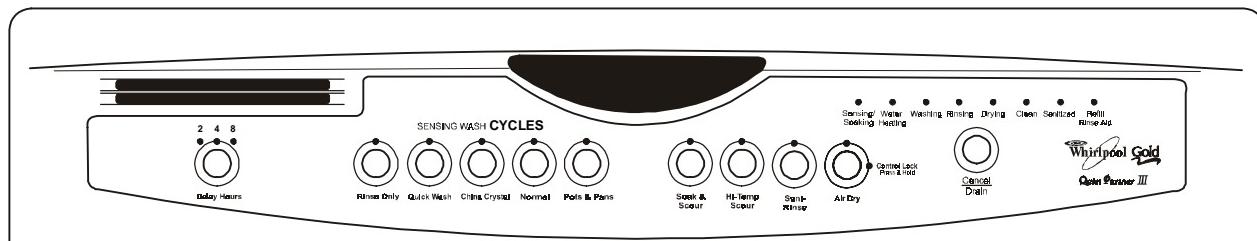
HEATING ELEMENT HEATING RATE: 1°+ F Rise per Minute

SECTION TWO

THEORY OF OPERATION

CONTROL PANEL

MODEL: GU1200XTK



CYCLE SELECTION CHART

Select the wash cycle and options desired. Upon selecting the cycle key, the cycle will begin immediately. Cycles may be changed at any time, during the first fill. Options can be selected or changed at any time.

NOTE: The last options used will be recalled from memory automatically upon selecting a cycle, (if the option is valid with the cycle selected).

A "●" shows what steps are in each cycle.

Temperatures indicate where extra heat is added.

Water usage is shown in U.S. gallons/liters.

Cycle time includes dry time. An asterisk (*) by the cycle time indicates the cycle time might be longer depending on the temperature of the water entering the dishwasher. The cooler the water, the longer the cycle time. If the water is already hot enough, the cycle time will be as shown.

Pots & Pans



Use this cycle for hard-to-clean, heavily-soiled pots, pans, casseroles, and regular tableware.



Use both detergent dispenser sections.

Soil Level Sensed	Wash	Main Wash	Rinse	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
High	●	● 140°F (60°C)	●	●	● 140°F (60°C)	●	95*	8.8-10.1/ 33.3-38.2
Low	●	● 130°F (54°C)	●		● 140°F (60°C)	●	87*	6.9/26.2



Use this cycle for loads with normal amounts of food soil. (The energy-usage label is based on this cycle.)



Use both detergent dispenser sections.

Soil Level Sensed	Wash	Main Wash	Rinse	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
High	●	● 140°F (60°C)	●	●	● 140°F (60°C)	●	95*	8.8-10.1/ 33.3-38.2
Low	●	● 130°F (54°C)	●		● 140°F (60°C)	●	87*	6.9/26.2



Use this cycle for china and crystal. This cycle uses a light wash and gentle dry. During the heated dry, the heating element cycles on and off.



Use main detergent dispenser section.

Soil Level Sensed	Rinse	Main Wash	Rinse or Purge	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
High	●	●	●		● 135°F (57°C)	● cycled	79*	7.1-8.6/ 26.9-32.6
Low		●	●	Purge	● 135°F (57°C)	● cycled	79*	5.5/20.8



Use this cycle for pre-rinsed or lightly-soiled loads. This cycle automatically adds a fill and brief pre-wash, purging the hot water line and improving wash results, without adding time for water heating periods.



Use main detergent dispenser section.

First Fill Water Temp.	Rinse	Main Wash	Rinse	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
Greater than 135°F (57°C)		●	●		●	●	48*	5.2-6.7/ 19.7-25.4
Less than 135°F (57°C)	●	●	●		●	●	44*	6.9-8.4/ 26.1-31.8

	Rinse Only	Use this rinse cycle for rinsing dishes, glasses, and silverware that will not be washed right away.		Do not use detergent with this cycle.			
Wash	Main Wash	Rinse	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gall/L)
			●			10	1.8-2.1 / 6.8-7.9

NOTE: The Soil Sensor monitors water pressure at the output of the drain pump. Cycle time and/or water usage can vary from the numbers above as the sensor adjusts the cycle for the best wash performance. Water pressure varies depending on the soil concentration in the accumulator.

One or all of the following may be used to achieve the desired washing performance of a selected wash cycle.

Automatic Purge Filtration

The Automatic Purge Filtration (APF) feature may also be invoked if the soil sensor detects excessive soils. This can occur during selected wash or rinse cycles. APF mode provides one or more purges of excess soils trapped in the soil accumulator at specified intervals in the cycle.

The APF operates for a total of 10 seconds while the wash motor is operating in a wash or rinse mode. The accumulator screen will be cleaned from jets on the underside of the lower spray arm.

During the first five seconds, the drain motor turns on and the fill valve is activated. This purges the soiled water from the accumulator and begins to add fresh water. For the remaining five seconds, the drain pump is turned off, but the fill valve remains activated to bring wash water up to proper level.

Canceling a Cycle

Anytime during a cycle, press



The dishwasher starts a two minute drain (if needed.) Let the dishwasher drain completely. The light turns off after two minutes.

To Stop the Drain

Press CANCEL/DRAIN a second time to stop the drain immediately. Always drain the dishwasher before starting a new cycle.

To Clear the Indicators

Press CANCEL/DRAIN before starting the dishwasher to clear all options and cycles.

Changing a Cycle or Setting

During the first minute of a cycle:

1. Press a new cycle and/or options.
2. Check the detergent dispensers. They must be filled properly for the new cycle.

After the first minute of a cycle:

1. Press:



CANCEL/DRAIN glows. The dishwasher starts a two minute drain (if needed.) Let the dishwasher drain completely.

2. Check the detergent dispensers. They must be filled properly for the new cycle.
3. Close the door.
4. Press a new cycle and/or options.
5. Press Start.

ADDING ITEMS DURING A CYCLE

Items can be added any time before the main wash starts. Open the door and check the detergent dispenser. If the cover is still closed, add items.

To Add Items:

1. Lift up the door latch to stop the cycle. Wait for the spraying action to stop before opening the door.
2. Open the door. If the detergent dispenser cover is still closed, add the item(s).
3. Close the door firmly until it latches. The dishwasher resumes the cycle after a five (5) second pause.

OPTION SELECTION

Soak & Scour



Select this option to run a 4 hour pre-soak before the selected cycle. The pre-soak consists of a standard fill, an initial 8 minute wash, then 13 wash pulses, each 90 seconds long with a 16 minute pause between pulses. This keeps the dishes wet and soaking. At the conclusion of the pre-soak, the dishwasher drains and the selected cycle begins.

NOTE: The Soak & Scour option is allowed with the Pots & Pans cycle only.

Hi-Temp Scour



Select this option to increase the target water temperature during the wash portion of the cycle. Hi-Temp Scour raises this target water temperature to 145° F (63° C) in the Main Wash for all cycles. In the Pots & Pans cycle, Hi-Temp Scour also raises the target water temperature to 135° F (57° C) in the pre-wash. Heating the water helps improve washing results. Hi-Temp Scour is useful when loads contain baked-on food.

This option adds heat, water and wash time by adding at least one additional rinse mode to the cycle.

NOTE: Hi-Temp Scour is an option with Pots & Pans and Normal.

Sani-Rinse



Select this option to raise the water temperature in the final rinse to approximately 160° F (70° C) for 10 minutes. Sani-Rinse adds heat and time to the cycle. In the Normal cycle, this high temperature rinse sanitizes the dishes and glassware in accordance with the NSF International requirements (#95/480/05/2480).

NOTE: Sani-Rinse is an option with the Pots & Pans and Normal cycles.

Air Dry



Select this energy-saving option to dry without heat. Air drying is useful when loads contain plastic dinnerware that may be sensitive to high temperatures. The dishes take longer to dry and spotting can occur. For best drying, use a liquid rinse aid. Some items, such as plastics, may need towel drying.

NOTE: Rinse Only does not have a dry period. Air Dry is an option with all other cycles.

Control lock



Use the Control Lock to prevent the dishwasher from accidentally being turned on. Use the Control Lock, also, to prevent accidental cycle or option changes during a cycle.

When the Lock LED is lit, all buttons are disabled.

NOTES:

- The dishwasher door can be opened while the controls are locked.
- The lock can be turned on while the dishwasher is running.

To Turn on the Control Lock:

Press and hold Air Dry for four (4) seconds. The LOCK LED will glow.

To Turn off the Lock:

Press and hold Air Dry for 4 seconds. The LED turns off.

Delay Hours

Select this option to run the dishwasher at a later time or during off-peak hours.

To Delay the Start:

1. Close the door.
2. Press Delay Hours 1 time for a 2-hour delay, 2 times or a 4-hour delay or 3 times for an 8-hour delay.
3. Select a wash cycle and options.



The number glows above Delay Hours. The dishwasher starts the cycle in the selected number of hours.

NOTE: To cancel the delay and begin cycle immediately, press Delay Hours until all delay hours LEDs are off.

Cycle Status Indicators

The progress of the dishwashing cycle can be followed with the Cycle Status Indicators.



Sensing/Soaking

The dishwasher senses the soil level on the dishes. Soil level determines the length of some cycles, the amount of heat added to the wash and the number of rinses needed in the cycle for the load. It also senses the temperature of the water during thermal hold water heating periods. SENSING/SOAKING glows during the soil sensing and thermal hold portions of the cycle. Wash action continues while sensing occurs. SENSING/SOAKING also glows during "soaking" events and the 4-hour pre-soak cycle invoked by the Soak & Scour Option.

Sanitized

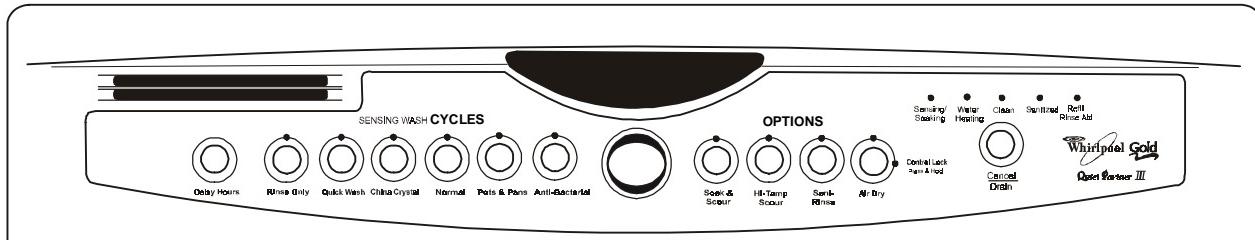
If the Sani Rinse option is selected, SANITIZED glows when the Sani Rinse cycle is finished. If the dishwasher did not properly sanitize the dishes, the light flashes at the end of the cycle. This can happen if the cycle is interrupted or the dishwasher failed to reach sani temperatures. The light goes off when any key is selected or the door is opened and reclosed.

Clean

CLEAN glows when a cycle is finished. The light turns off when the door is opened and reclosed or any key is pressed.

CONTROL PANEL

MODEL: GU1500XTK



CYCLE SELECTION CHART

Select the wash cycle and options desired. Upon selecting the cycle key, the cycle will begin immediately. Cycles may be changed at any time, during the first fill. Options can be selected or changed at any time.

NOTE: The last options used will be recalled from memory automatically upon selecting a cycle, (if the option is valid with the cycle selected).

A "●" shows what steps are in each cycle.

Temperatures indicate where extra heat is added.

Water usage is shown in U.S. gallons/liters.

Cycle time includes dry time. An asterisk (*) by the cycle time indicates the cycle time might be longer depending on the temperature of the water entering the dishwasher. The cooler the water, the longer the cycle time. If the water is already hot enough, the cycle time will be as shown.

**Anti-Bacterial**

Use this cycle for all day-to-day soil types, including both normal and heavy soils, giving you exceptional cleaning performance combined with reassuring sanitization.

**Use both detergent dispenser sections.**

Soil Level Sensed	Wash	Main Wash	Rinse	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
High	● 130°F (54°C)	● 140°F (60°C)	●	●	● 160°F (71°C)	●	99*	8.8-10.4/ 33.3-39.4
Low	● 130°F (54°C)	● 140°F (60°C)	●		● 160°F (71°C)	●	91*	6.9/26.2

**Pots & Pans**

Use this cycle for hard-to-clean, heavily-soiled pots, pans, casseroles, and regular tableware.

**Use both detergent dispenser sections.**

Soil Level Sensed	Wash	Main Wash	Rinse	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
High	● 130°F (54°C)	● 140°F (60°C)	●	●	● 140°F (60°C)	●	97*	8.8-10.4/ 33.3-39.4
Low	● 130°F (54°C)	● 140°F (60°C)	●		● 140°F (60°C)	●	89*	6.9/26.2

**Normal**

Use this cycle for loads with normal amounts of food soil. (The energy-usage label is based on this cycle.)

**Use both detergent dispenser sections.**

Soil Level Sensed	Wash	Main Wash	Rinse	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
High	●	● 140°F (60°C)	●	●	● 140°F (60°C)	●	85*	8.8-10.1/ 33.3-38.2
Low	●	● 130°F (54°C)	●		● 140°F (60°C)	●	87*	6.9/26.2

**China Crystal**

Use this cycle for china and crystal. This cycle uses a light wash and gentle dry. During the heated dry, the heating element cycles on and off.

**Use main detergent dispenser section.**

Soil Level Sensed	Rinse	Main Wash	Rinse or Purge	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
High	●	●	●		● 135°F (57°C)	● cycled	79*	7.1-8.6/ 26.9-32.6
Low		●	●	Purge	● 135°F (57°C)	● cycled	79*	6.6/20.8

**Quick Wash**

Use this cycle for pre-rinsed or lightly-soiled loads. This cycle automatically adds a fill and brief pre-wash, purging the hot water line and improving wash results, without adding time for water heating periods.

**Use main detergent dispenser section.**

First Fill Water Temp.	Rinse	Main Wash	Rinse	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
Greater than 135°F (57°C)		●	●		●	●	48*	5.2-6.7/ 19.7-25.4
Less than 135°F (57°C)	●	●	●		●	●	44*	6.9-8.4/ 26.1-31.8

**Rinse Only**

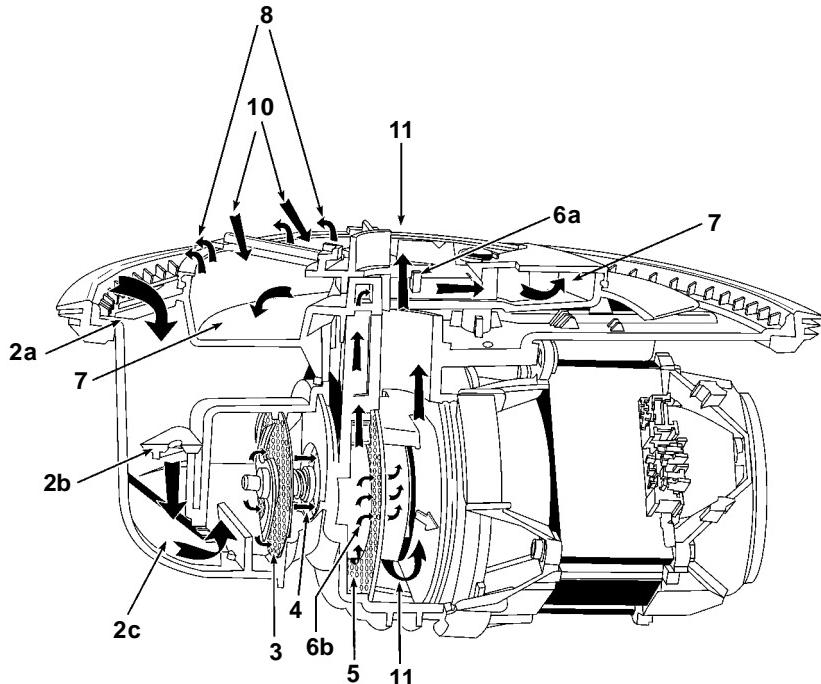
Use this rinse cycle for rinsing dishes, glasses, and silverware that will not be washed right away.

**Do not use detergent with this cycle.**

Wash	Main Wash	Rinse	Rinse	Final Heated Rinse	Dry	Time (min)	Water Usage (gal/L)
			●			10	1.8-2.1/ 6.8-7.9

FUNCTION DESCRIPTION

The washing action of the Point Voyager Dishwasher performs more work and maintains higher performance with reduced energy consumption. This is accomplished with the following: 1) A redesigned wash system using separate wash and drain pumps. 2) A soil sensor and thermistor which monitor washing conditions. 3) An electronic control board which adjusts cycle functions to optimize washing performance.

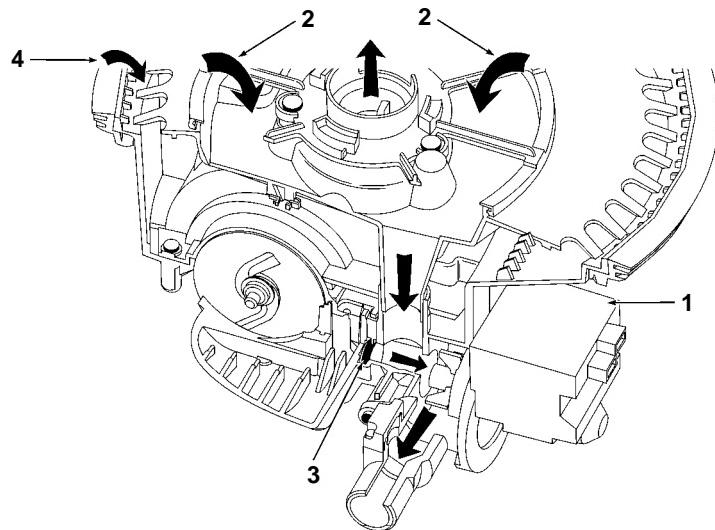


Wash/Rinse Function

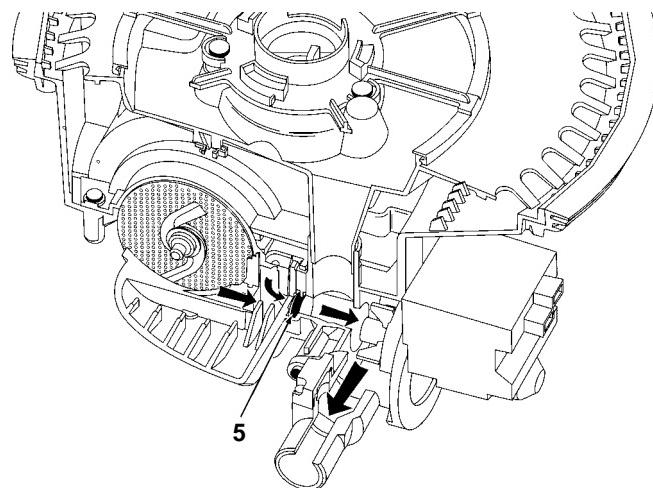
1. The main wash water passes from the spray arm nozzles, over the dish load and into the sump assembly, where a number of operations occur.
2. Water and soils pass through the course protection grate at the top of the sump assembly (**2a**) and then passes through the foreign object protector (**2b**) into the main wash pump inlet chamber (**2c**).
3. The water then passes through the chopper assembly where food particles are reduced in size so they can pass through the water delivery system. (**3**)
4. Water is drawn through the impeller and into the pump chamber. (**4**)
5. Here, 20 percent of the water is diverted towards the soil accumulator. Food soils in this water stream are captured by the separation screen. (**5**)
6. Downstream restrictions limit the water flow into the accumulator to 10 percent.
- (6a) The remaining water is allowed to rejoin the main wash flow by passing through the separation screen. (**6b**)
7. This heavily soiled water is distributed throughout the accumulator. (**7**) Soils will remain trapped in the accumulator until a drain or Automatic Purge Filtration event takes place.
8. Since the water in the accumulator is under some minimal pressure, it rejoins the main wash water by flowing through the accumulator screen into the tub. (**8**)
9. For this to occur properly it is critical that the dishwasher be installed perfectly level.
10. Jets located on the underside of the lower spray arm continuously wash down the accumulator screen to allow more soils to concentrate. (**10**)
11. The remaining 80 percent of the wash water will flow from the impeller through the volute and up through the spray arms. (**11**)

Drain Function

1. During the Drain function, a separate drain pump motor is started while the main wash pump motor continues to operate for 1 minute. (1) This accomplishes three goals.
2. First, the jets on the underside of the lower spray arm continue to flush soils from the accumulator screen while the water is drained from the unit. (2)
3. Second, negative pressure in the main wash pump inlet chamber keeps the check valve closed, allowing the drain pump to remove soiled water from the accumulator. (3)
4. Third, the spray arms will rinse down the interior of the wash tub while the water is drained, leaving the inside free of soils. (4)



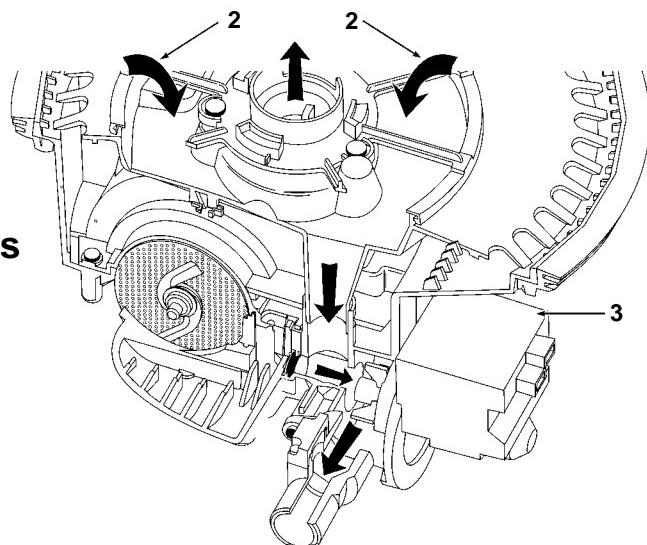
5. The main wash pump then stops creating positive pressure in the pump's inlet chamber. This opens the check valve allowing the remaining water to be drained away. (5)



Automatic Purge Filtration

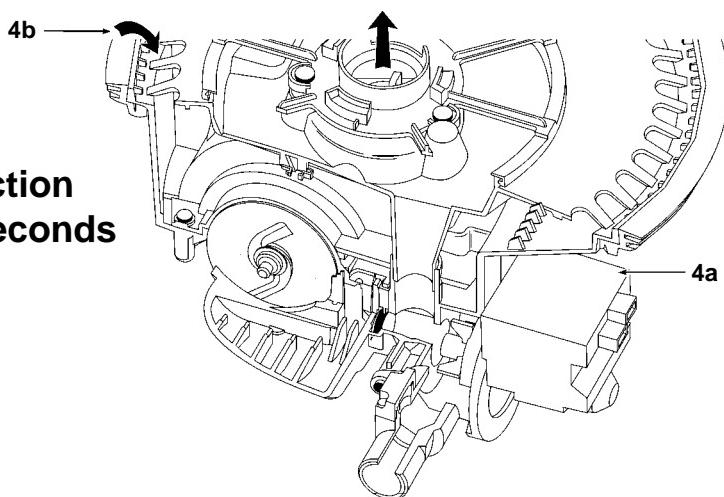
1. The Automatic Purge Filtration feature may be invoked if the soil sensor detects excessive soils. This can occur during selected wash or rinse functions. APF mode provides one or more purges of excess soils trapped in the soil accumulator at specified intervals in a cycle.
2. The APF mode operates for a total of 10 seconds while the wash pump is operating in a wash or rinse mode. The accumulator screen will be cleaned from jets on the underside of the lower spray arm. (2)
3. During the first five seconds, the drain pump turns on and the fill valve is activated. This purges the soiled water from the accumulator and begins to add fresh water. (3)

**APF Function
First Five Seconds**



4. For the remaining five seconds, the drain pump is turned off, (4a) but the fill valve remains activated to bring wash water up to the proper level. (4b)

**APF Function
Last Five Seconds**



Theory Resources

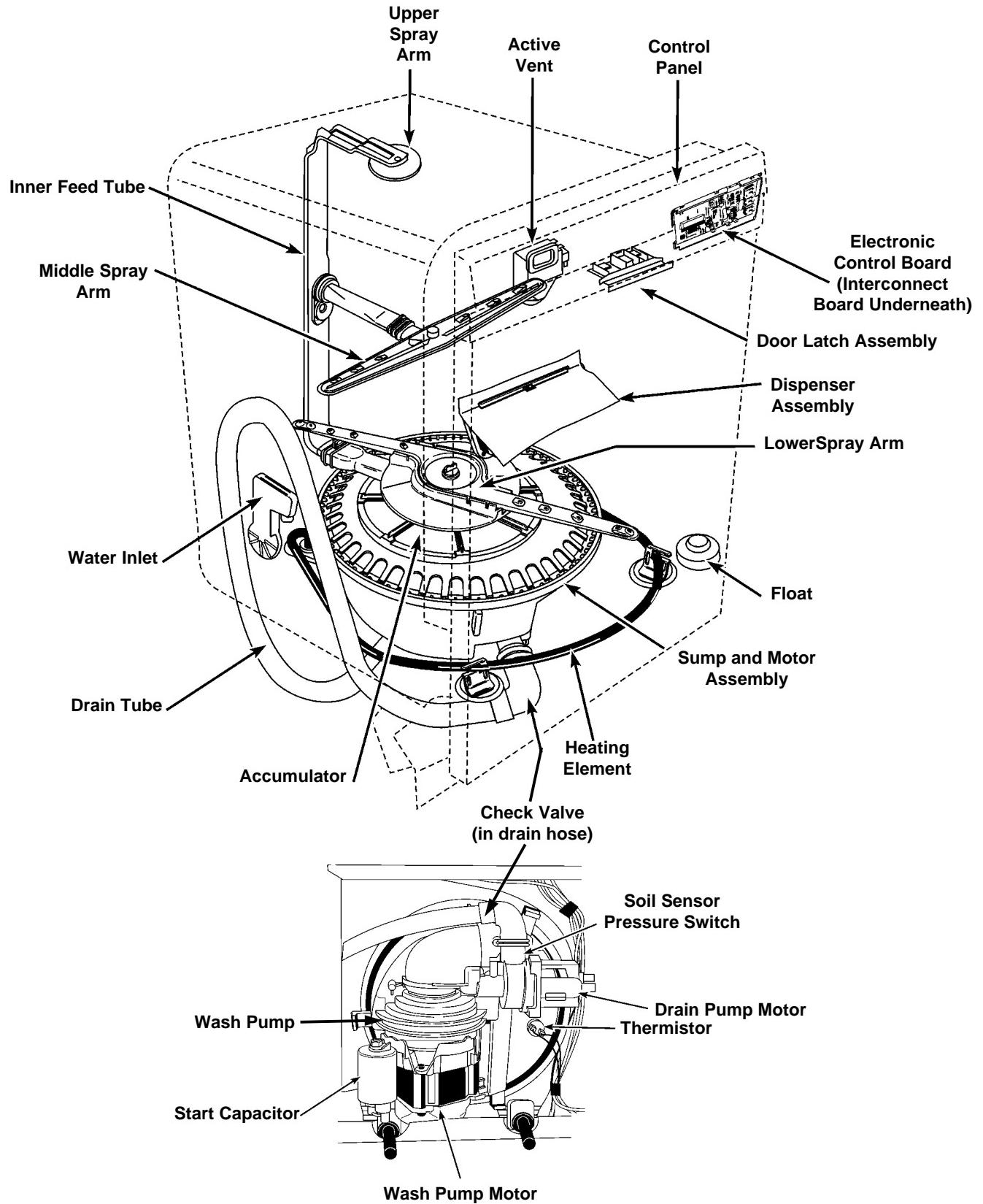
The tech sheet, found behind the access panel provides a Common Cycle Time Chart. This chart will allow the service technician to identify and track each operation of the dishwasher by timed interval. See Section Four, Troubleshooting and Diagnosis for instruction on how to use this chart with the Diagnostic Routines built into the electronic controls of the dishwasher.

-- NOTES --

SECTION THREE

COMPONENT ACCESS

COMPONENT LOCATION





IMPORTANT

Electrostatic Discharge (ESD) Sensitive Electronics

ESD problems are present everywhere. ESD may damage or weaken the electronic control assembly. The new control assembly may appear to work well after repair is finished, but failure may occur at a later date due to ESD stress.

- Use an antistatic wrist strap. Connect wrist strap to green ground connection point or unpainted metal in the appliance. - OR - Touch your finger repeatedly to a green ground connection point or unpainted metal in the appliance.
- Before removing the part from its package, touch the antistatic bag to a green ground connection point or unpainted metal in the appliance.
- Avoid touching electronic parts or terminal contacts; handle electronic control assembly by edges only.
- When repacking failed electronic control assembly in antistatic bag, observe above instructions.



WARNING



ELECTRICAL SHOCK HAZARD

Disconnect power before servicing the dishwasher.

Replace all panels before operating the dishwasher.

Failure to do so can result in death or electrical shock.

ACCESSING COMPONENTS IN THE DOOR

Removing the Console Panel

The control panel on the Voyager Dishwasher can be removed from the dishwasher door.

1. Remove the six (6) screws securing the control panel to the door frame. (*Fig. 3-1*)
2. The control panel will now drop down and be free of the door assembly. The wiring harness will remain connected to the console components.

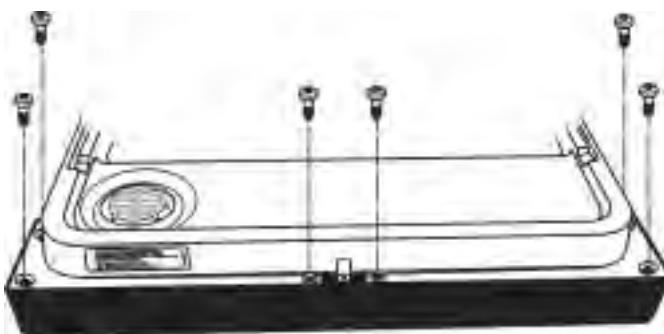


Fig. 3-1

Removing the Electronic Control Board

The electronic control board is located inside the console at the top of the dishwasher door.

1. Disconnect the ribbon connector and the wiring harness connectors from the electronic control board. (*Fig. 3-2*)
2. Use a flat bladed screwdriver to depress the holding tabs at the left end of the control board assembly while pulling up. (*Fig. 3-3, Inset*)

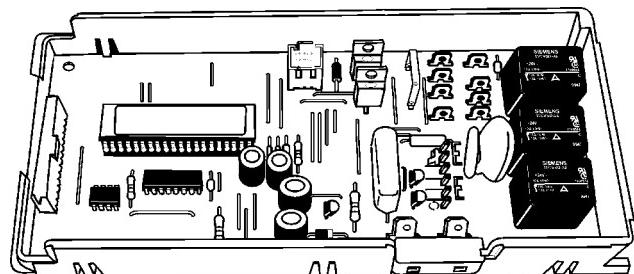


Fig. 3-2

Use a flat bladed screwdriver to depress the holding tabs at the left end of the control board assembly while pulling up as shown here.

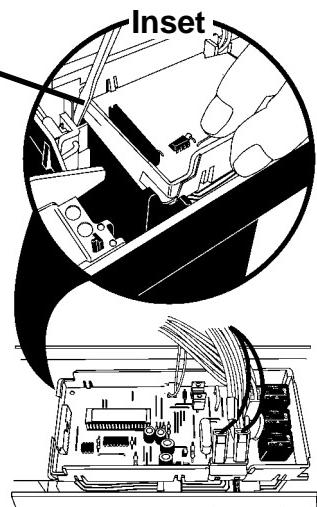


Fig. 3-3

Removing the Door Latch Assembly

Release the tabs securing the door latch assembly to the control panel and lift the assembly out. (*Fig. 3-4, Inset*)

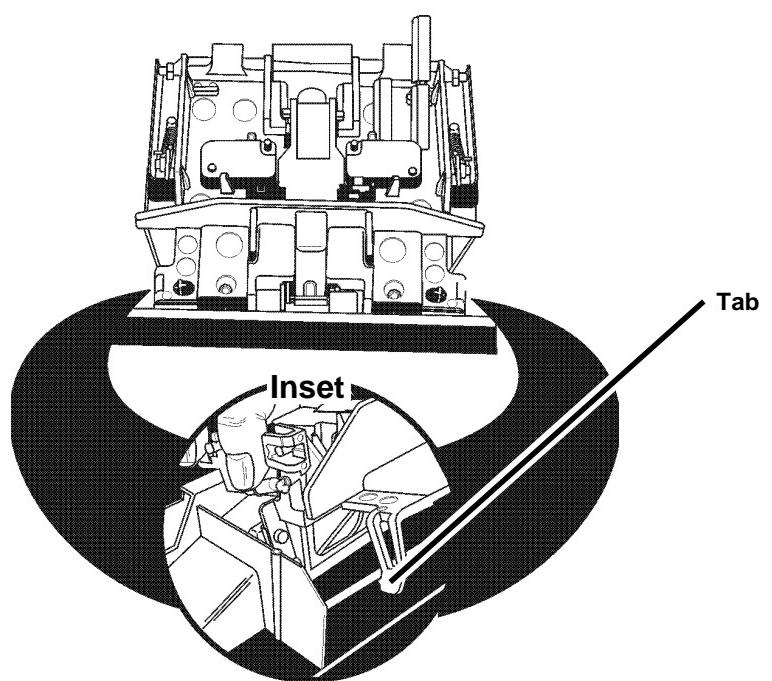


Fig. 3-4

Removing the Door Microswitches

The Door Switches are located on the right and left side of the door latch assembly.

1. Disconnect the wiring harness connectors from the microswitch terminals.
2. Pull back on the two (2) plastic retaining tabs securing the microswitches to the door latch assembly and lift the microswitches out. (Fig. 3-5)

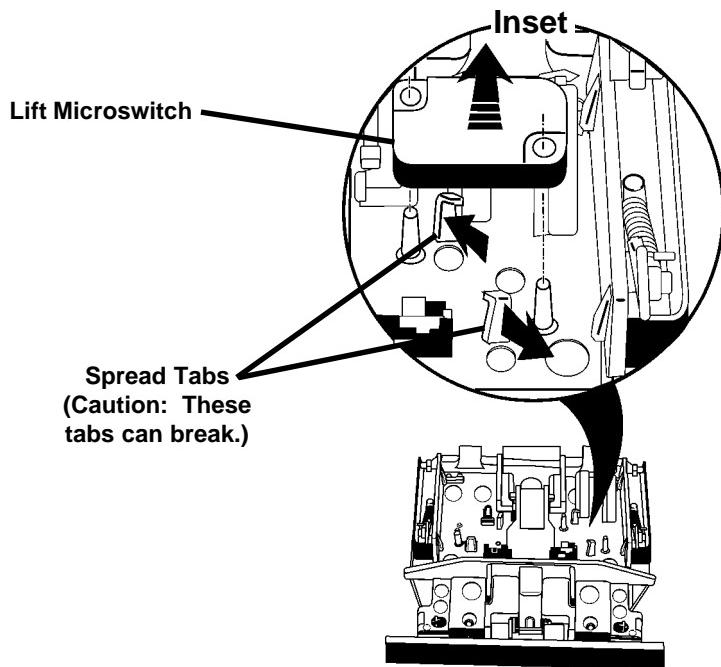


Fig. 3-5

Removing the Active Vent Assembly

The Active Vent Assembly is located in the console area.

1. Remove the six (6) screws securing the control panel to the door frame.
2. Disconnect the wiring harness connectors from the wax motor terminals on the active vent assembly.
3. Loosen, but do not remove the four T-15 Torx screws securing the left side of the outer door panel to the door frame. This will provide additional room to easily remove the active vent assembly.
4. Using a flat bladed screwdriver in the slot provided at the bottom of the interior vent grille, turn the vent grille counterclockwise $\frac{1}{4}$ turn and remove the grille. (Fig. 3-6)
5. The active vent assembly will drop free of the dishwasher door.

Use Flat Bladed
Screwdriver and Turn
Interior Vent Grille $\frac{1}{4}$ Turn
Counter-clockwise

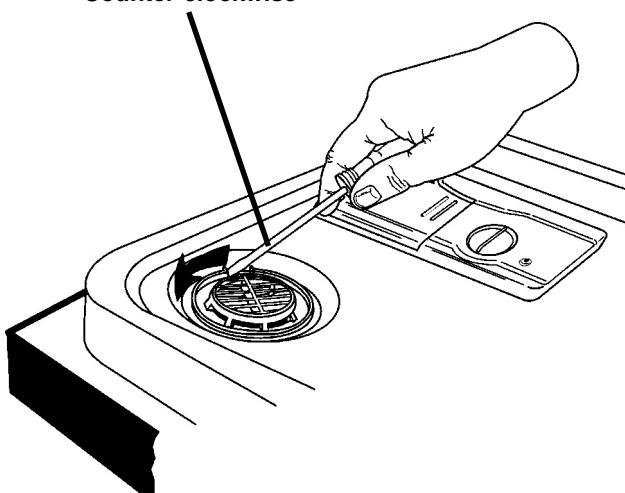
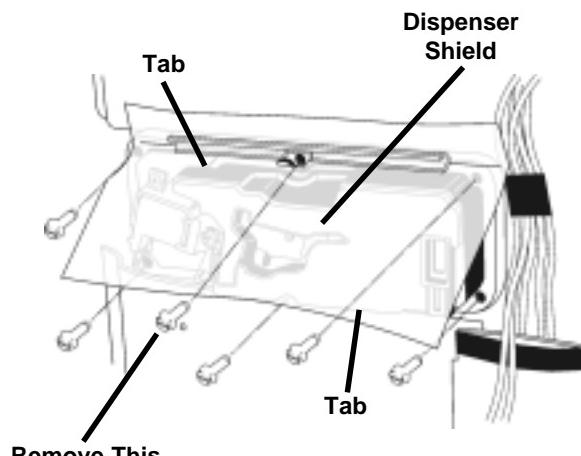
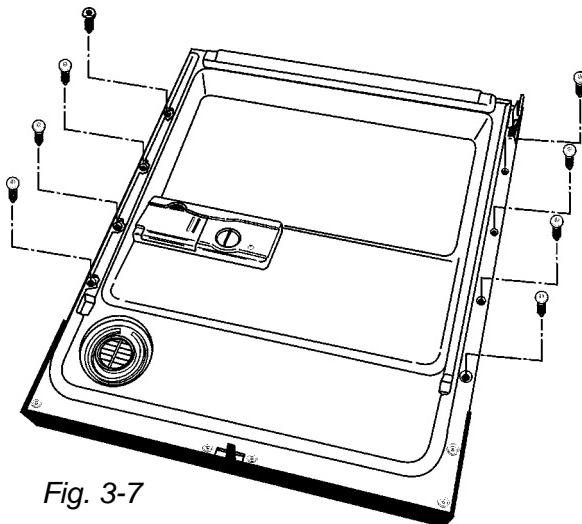


Fig. 3-6

Removing the Dispenser Assembly

The Dispenser Assembly is located in the lower portion of the dishwasher door below the console area.

1. Remove the eight (8) screws securing the outer door panel to the dishwasher door frame. (Fig. 3-7) Remove the outer door panel from the door frame.
2. Remove the center top hex head screw and remove the dispenser shield and disconnect the wiring harness connectors from the detergent dispenser solenoid. (Fig. 3-8)
3. Remove the remaining five (5) screws securing the dispenser assembly to the inner door liner. (Fig. 3-8)
4. Bend the two locking tabs at the top and bottom of the dispenser assembly up away from the dispenser body.
5. The dispenser assembly can now be lifted from the inner door liner.

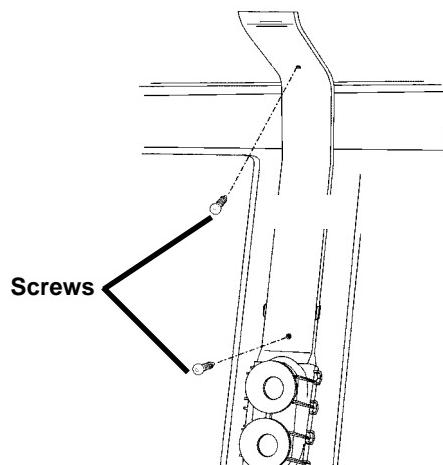


SERVICING COMPONENTS INSIDE THE WASH TUB

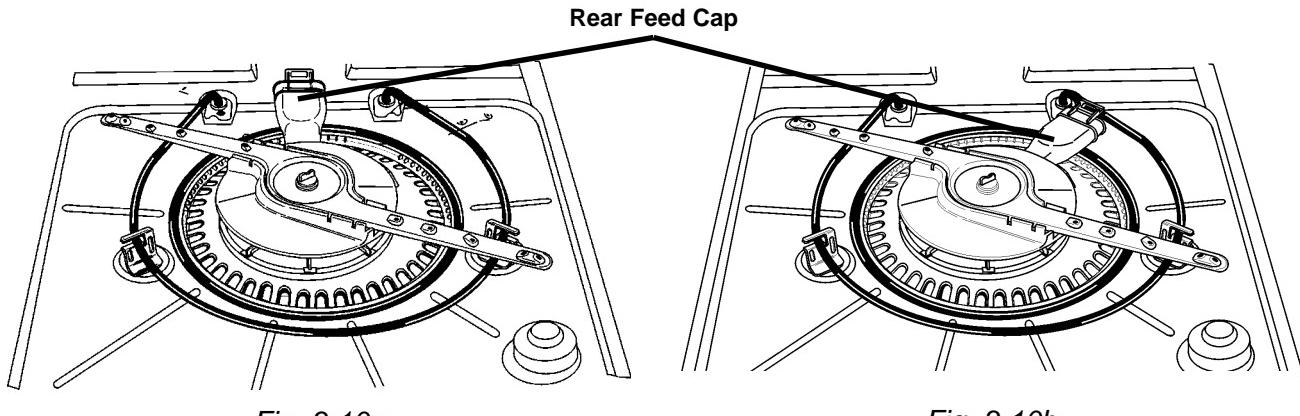
Removing the Inner Feed Tube and Lower Spray Arm

The Inner Feed Tube is held in place by two (2) screws. (Fig. 3-9) One is located on the inner top of the dishwasher tub. The second is located on the back of the dishwasher tub.

1. Remove the two (2) dishracks from the dishwasher tub.
2. Remove the two (2) screws securing the Inner Feed Tube to the inside of the dishwasher tub.



3. Rotate the rear feed cap (Fig. 3-10a) $\frac{1}{4}$ turn clockwise (Fig. 3-10b)

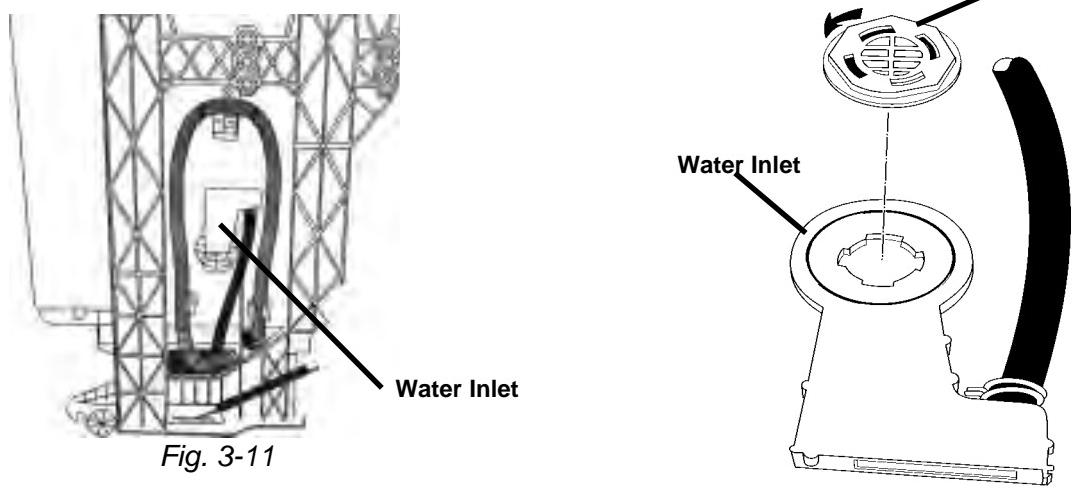


4. The entire inner water tube assembly and the lower spray arm assembly can now be removed from the dishwasher tub.

Removing the Water Inlet

The water inlet is located on the left side of the dishwasher tub. (Fig. 3-11)

1. From the inside of the tub, use a small pair of Channel Locks™ and turn the inlet grille $\frac{1}{4}$ turn counterclockwise and remove the grille. (Fig. 3-12)
2. The water inlet can now be separated from the dishwasher tub.

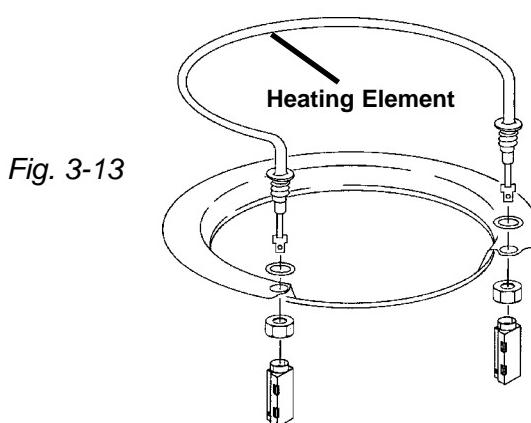


Servicing the Heating Element

The heating element (Fig. 3-13) should not be removed unless it has failed. All critical components of the dishwasher can be removed without removing the heating element.

If the heating element must be removed, it must be replaced with a new one.

When installing a new heating element, follow the Installation Instructions provided with the new item.



Servicing the Overfill Assembly

Removing the Float

The float (*Fig. 3-14*) can be removed from inside the tub.

1. Tip the float slightly and gently toward the back of the tub and lift up to disengage it from the overfill assembly body.

Removing the Overfill Control Switch

The overfill control switch can be removed from the overfill assembly without removing the assembly from the tub.

1. Remove the toe and access panels from the bottom of the dishwasher.
2. Unsnap the cover over the overfill control switch.
3. Lift the overfill control switch from the assembly.
4. Disconnect the wiring harness connectors from the switch terminals.

Removing the Overfill Assembly

1. Remove the toe and access panels from the bottom of the dishwasher.
2. Remove the float.
3. Remove the standpipe nut.
4. Push the overfill assembly through the bottom of the tub.
5. Open the cover and lift the overfill control switch from the assembly.
6. Disconnect the wiring harness connectors from the switch terminals.

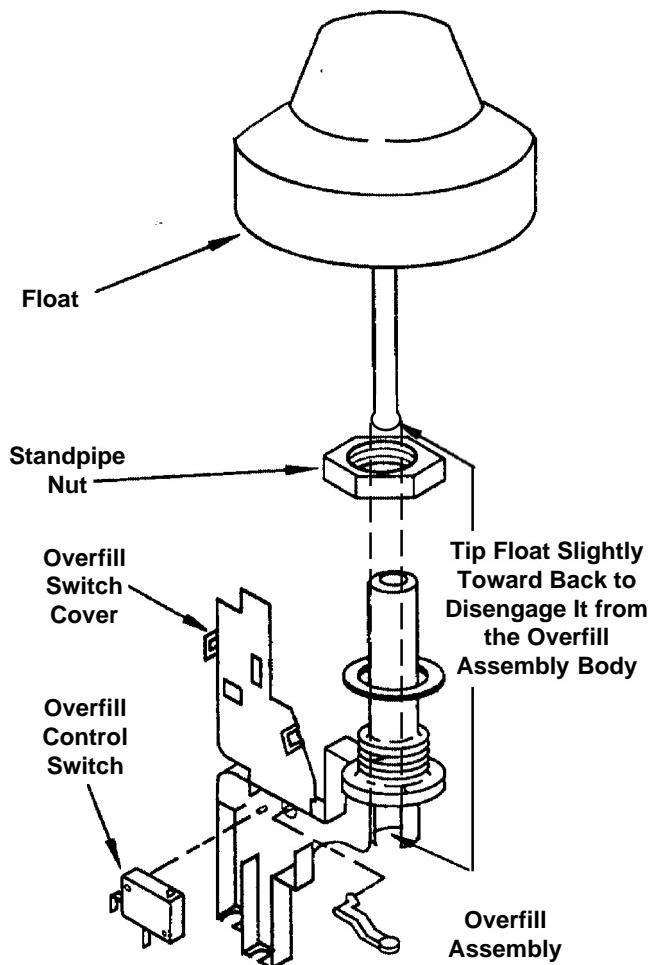


Fig. 3-14

Removing the Pump Assembly

The entire pump assembly can be removed from inside the dishwasher tub.

1. Remove the access and toe panels from underneath the dishwasher door by removing the two (2) screws securing it to the dishwasher frame. (Fig. 3-15)
2. Disconnect the wiring harness connectors from the drive motor and pump motor terminals, the soil sensor and the thermistor.
3. Disconnect the drain hose from the drain hose connector on the pump outlet.
4. Remove the pump motor. (See next page.)
5. Remove the three (3) sump tabs that secure the sump assembly to the dishwasher tub. (Fig. 3-16, Inset)
6. From inside the tub, lift the front of the sump up approximately $\frac{1}{2}$ inch.
Push the assembly back and then lift it out.

NOTE: When reinstalling the sump assembly, align the locator key with the corresponding slot in the tub opening.

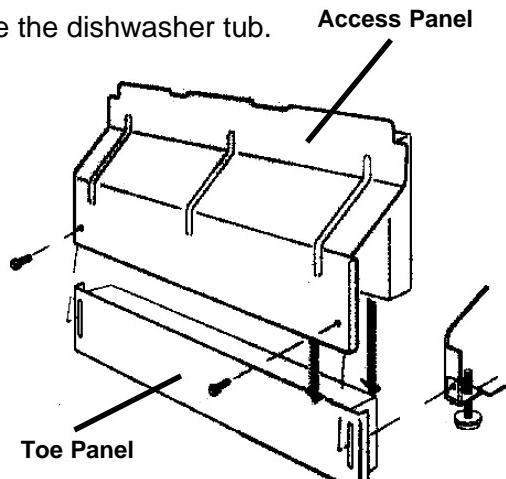


Fig. 3-15

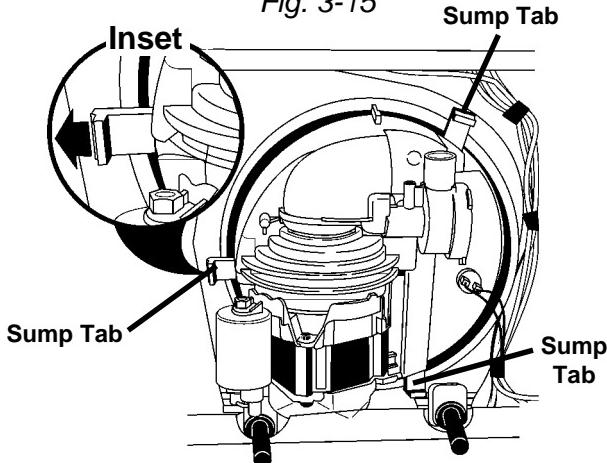


Fig. 3-16

SERVICING COMPONENTS IN THE SUMP ASSEMBLY

Removing the Wash Motor

1. Remove the bolt securing the wash motor and drip shield in place on the pump assembly. (Fig. 3-18)
2. Once the bolt and drip shield are removed, turn the wash motor until it stops (approximately $\frac{1}{4}$ turn).
3. Pull the motor straight back from the sump assembly. Some effort may be necessary to dislodge the motor. The volute will remain attached to the motor. (See Figure 3-29)

NOTE: When reinstalling the wash motor and volute, do not pinch the volute seal between the volute and sump. Use a small amount of rinse aid on the volute seal to help installation.

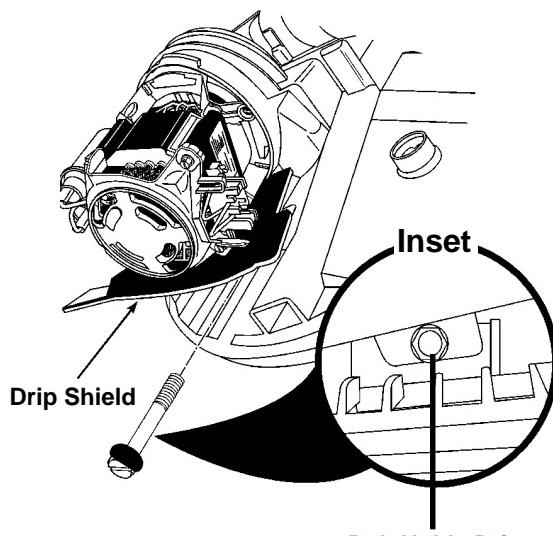


Fig. 3-17

Bolt Holds Drip
Shield in Place

Removing the Pump Motor

1. With one hand, press back on the plastic tab that holds the pump motor from rotating. (Fig. 3-18)
2. With the other hand, rotate the pump motor counterclockwise approximately $\frac{1}{4}$ turn. The pump motor will now be free of the pump assembly.

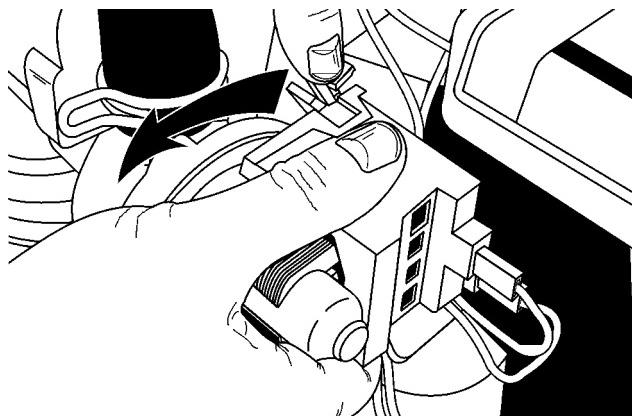


Fig. 3-18

Accessing Components of the Sump Assembly

Components inside the sump can be accessed without removing the sump from the dishwasher tub.

1. Remove the four (4) screws securing the soil accumulator from the sump base. (Fig. 3-19)
2. The soil accumulator will now lift free of the sump base. (Fig. 3-20)

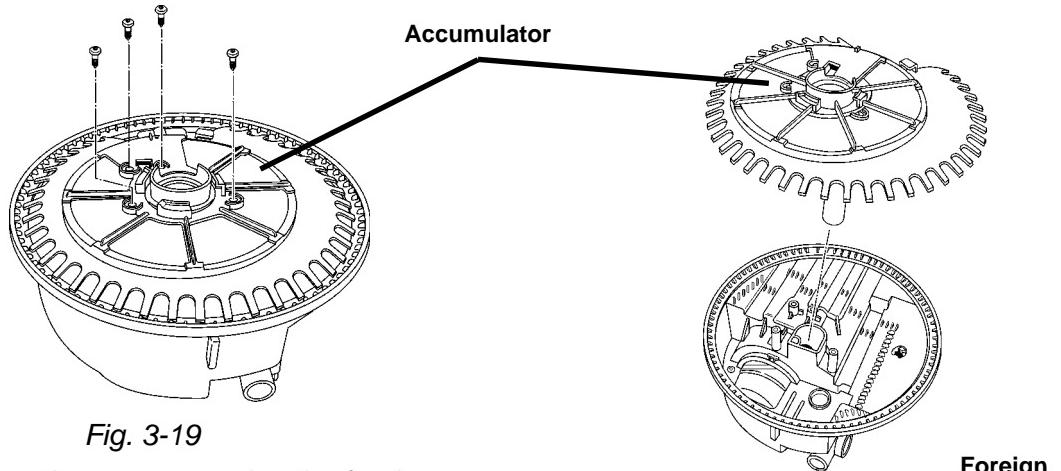


Fig. 3-19

3. Remove the screw securing the foreign objects protector to the sump base and remove the protector. (Fig. 3-21)
4. Remove the screw securing the inlet protector to the pump base and lift the inlet protector out. (Fig. 3-22)
5. Remove the chopper assembly from the impeller shaft and lift it from the sump base. (Fig. 3-23)

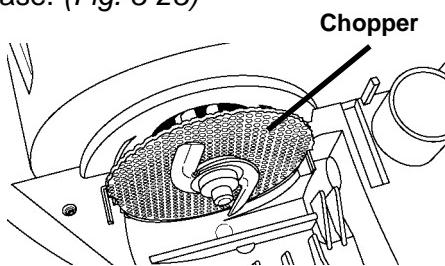


Fig. 3-21

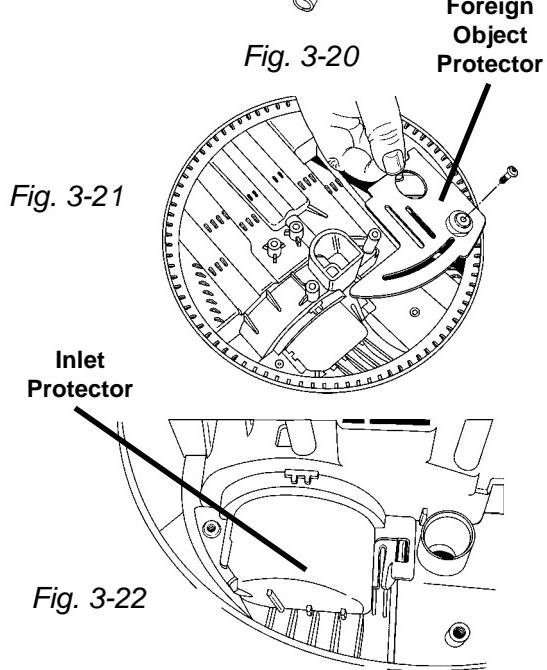


Fig. 3-22

- The check valve, located between the wash motor and the drain can be removed with a pair of needle nose pliers. (Fig. 3-24)

NOTE: When replacing the check valve, simply drop it in place. The inlet protector will seat the flapper valve properly when it is reinstalled.

- With the wash motor removed, the separation screen can be removed from the sump base. (Fig. 3-25)

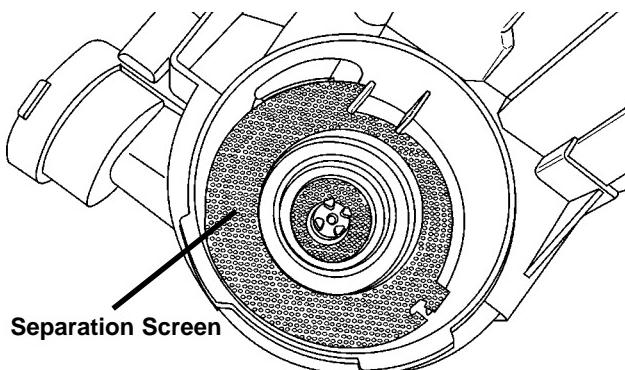


Fig. 3-25

- The thermistor can be removed from the sump by turning it $\frac{1}{4}$ turn counterclockwise and pulling it out. (Fig. 26) The thermistor can be removed without removing the sump assembly from the tub.

Access to the thermistor can be gained by removing the access and toe panels while the unit is in its installed position.

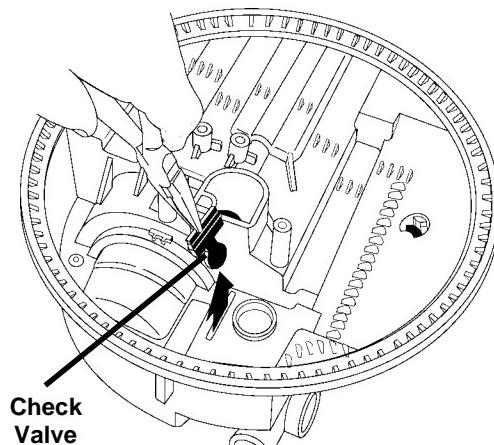


Fig. 3-24

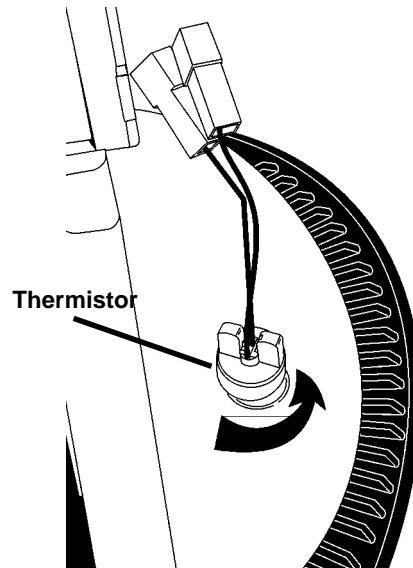


Fig. 3-26

Removing the Soil Sensor

If so equipped, a soil sensing pressure switch is mounted on the pump outlet. Disconnect the two wiring harness connectors from the switch terminals. Disconnect the drain hose. (Fig. 3-27A) Remove the screw securing the sensor switch to the pump base. Lift it from the pump outlet. (Fig. 3-27B)

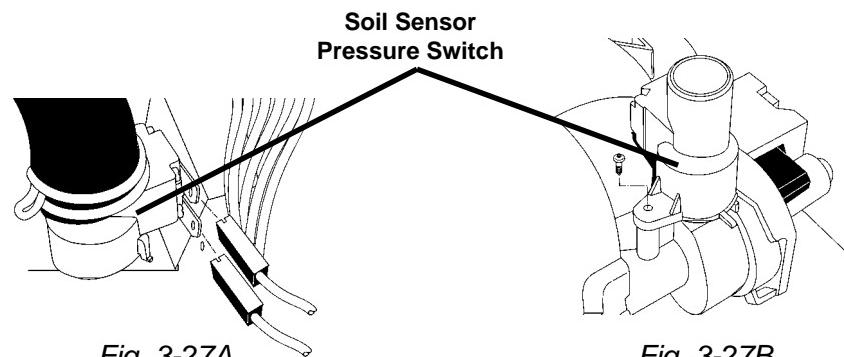


Fig. 3-27A

Fig. 3-27B

Removing the Impeller from the Wash Motor

The impeller is attached to the wash motor and can be removed once the wash motor is removed from the pump base.

1. Place the end of a flat-bladed screwdriver into the back of the wash motor to hold the armature of the motor from turning while unscrewing the impeller clockwise. (Fig. 3-28) Take care not to scratch or nick the motor windings.

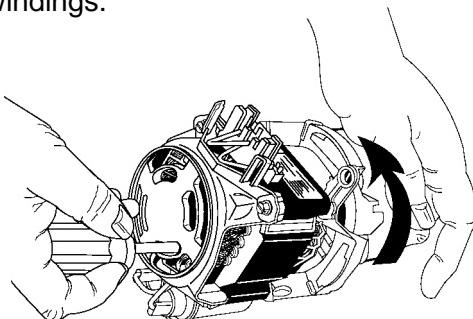


Fig. 3-28

Do not touch sealed surfaces on the impeller or the volute. Contamination or damage will cause premature failure.

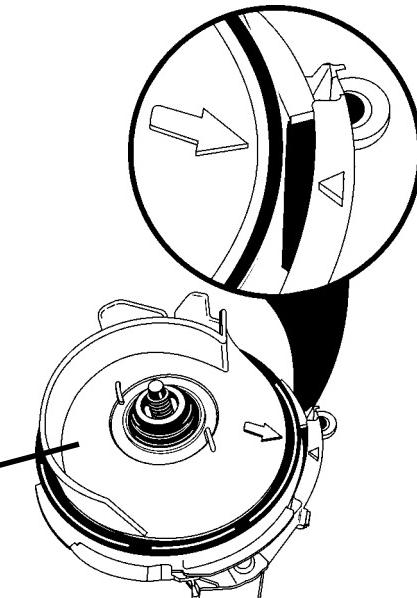


Fig. 3-29

To Remove the Volute

1. Align the arrow on the volute and the locator triangle on the wash motor frame as in Figure 3-29.
2. Lift the volute from the wash motor.

SERVICING THE DOOR HINGE

To service the door hinge the dishwasher must be removed from its installed position. Be sure to:

- Disconnect power from the unit.
- Disconnect the water supply line from the unit.
- Disconnect the drain line from the unit.

Once the side of the dishwasher is accessible:

1. Remove the outer door panel and console from the dishwasher door.
2. Remove the door spring from the tension adjustment at the bottom of the unit and then remove the spring link from the door hinge plate (Fig. 3-30).
3. Using a pair of pliers, slightly bend the tab on the door hinge plate to open the slot for the hinge pin. (Fig. 3-30, INSET- Arrow points at tab).

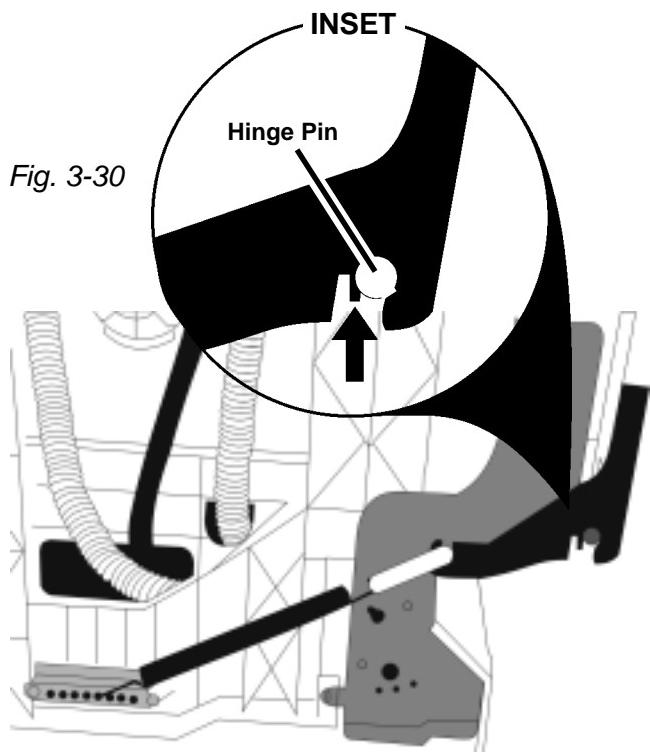
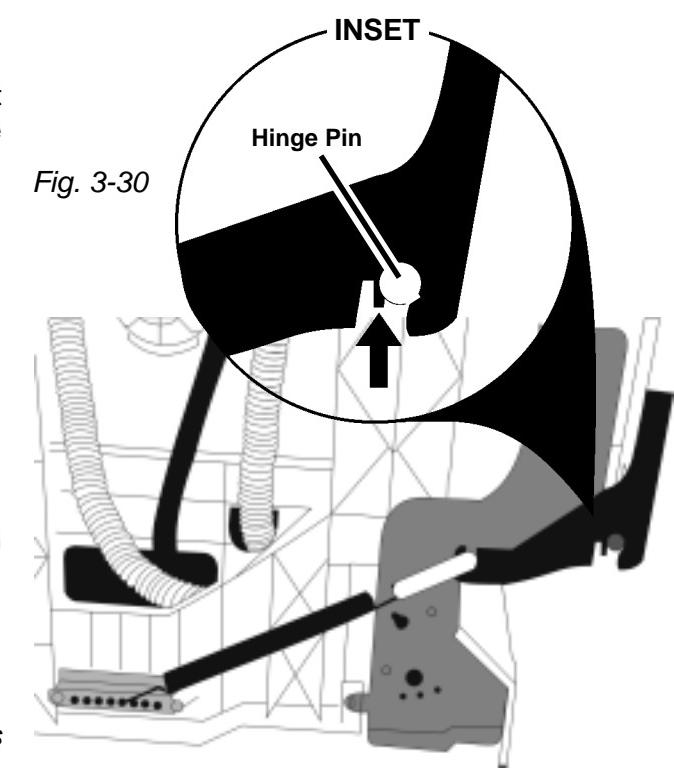


Fig. 3-30



4. Remove the three (3) screws securing the hinge plate to the front of the dishwasher inner door panel. (*Fig. 3-31*)
5. Open the door slightly. Hold onto the door assembly. With the counterbalance spring removed, the door will drop open easily.
6. Lift the door up to disengage it from the hinge pin (*Fig. 3-30, INSET*) and then carefully pull the hinge plate from the inner door panel.

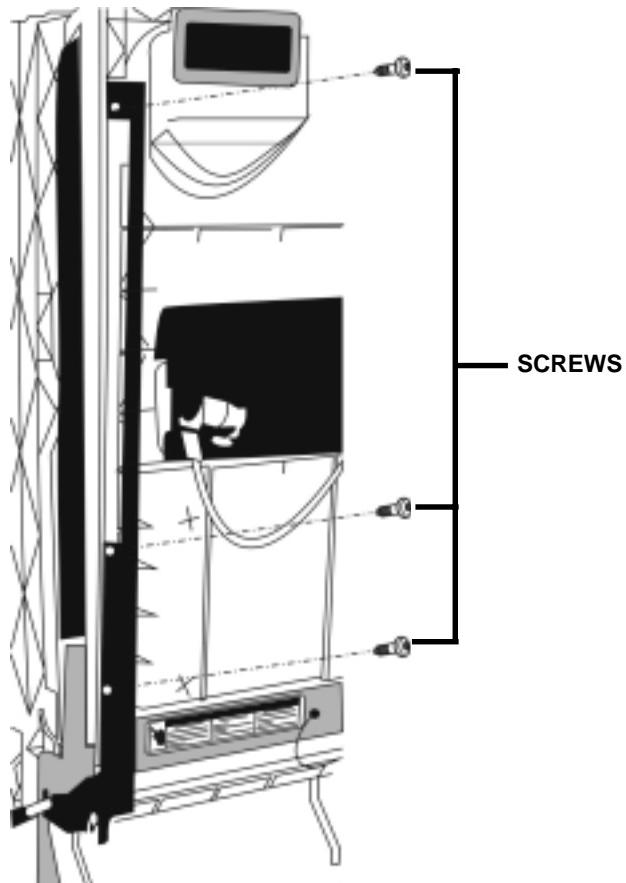


Fig. 3-31

SECTION FOUR

TROUBLESHOOTING AND DIAGNOSIS

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSES	CORRECTION/TEST
Dishwasher does not run or stops during a cycle	<ol style="list-style-type: none"> 1. Door is not latching properly. 2. Child lock is "ON". 3. Wash Cycle not set properly. 4. Household fuse blown or circuit breaker tripped. 5. Dishwasher is not wired into a circuit with proper voltage. 	<ol style="list-style-type: none"> 1. Check to make sure handle is properly seated in door latch assembly. Check that the door switch is opening and closing properly. 2. Turn child lock "OFF". See Use and Care Guide. 3. Review setting Wash Cycles in the Use and Care Guide. 4. Have a qualified electrician check the circuit breaker or fuse. 5. Have customer call a qualified electrician.
Dishwasher will not fill	<ol style="list-style-type: none"> 1. Overflow protection float is stuck in "up" position. 2. Fill valve is inoperable. 3. Control board is inoperable. 	<ol style="list-style-type: none"> 1. Check that the overflow protection float is free to move "up" and "down". Check that the overfill switch is opening and closing properly. 2. Check for continuity between contacts on fill valve. 3. Check for 120VAC between P8 and P2-3.
Dishwasher will not drain	<ol style="list-style-type: none"> 1. Air gap (if installed) is clogged. 2. Pump motor is inoperable 3. Control board is inoperable. 	<ol style="list-style-type: none"> 1. Follow air gap manufacturer's directions for cleaning. 2. Disconnect pump motor from wiring harness and check for continuity between GY & BU/ BK. 3. Check for 120VAC between P8 and P3..
Dishwasher will not dry dishes	<ol style="list-style-type: none"> 1. Heater element burned out. 2. Hi-Limit thermostat inoperable. 3. Active vent wax motor inoperable. 	<ol style="list-style-type: none"> 1. • Check for continuity between the terminals of the heater element. • Check for 120VAC between P8 and Neutral. 2. Check for continuity between terminals of the hi-limit thermostat. 3. • Check for continuity between terminals of the wax motor. • Check for 120VAC between P8 and Neutral.

COMMON CYCLE TIME CHART

PERIOD 1
PRE-WASH

INTERVAL	45	44	43	42	41	40	39	38
ANTI-BACTERIA / BAKED-ON COOKWARE								
NOTES 1A,14A,15,16								
INTERVAL TIME (min:sec)								
WITH HI TEMP SCRUB OPTION — ANY SOIL LEVEL	NOTE 14A	99:00 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
HIGH SOIL [Soil sensed in Interval 42]	NOTE 1A	99:00 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 50)								
LOW SOIL (or Non-Sensor Model) [No soil sensed in Interval 42]	NOTE 1A	91:25 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
POTS & PANS / HEAVY	NOTES 1A,14A,15,16							
INTERVAL TIME (min:sec)								
WITH P.SCROUR / H.T.SCRUB OPTION — ANY SOIL LEVEL	NOTE 14A	97:00w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
HIGH SOIL [Soil sensed in Interval 42]	NOTE 1A	97:00w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
LOW SOIL (or Non-Sensor Model) [No soil sensed in Interval 42]	NOTE 1A	89:25 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
NORMAL	NOTES 1A,9,14B,15,16							
INTERVAL TIME (min:sec)								
HIGH SOIL WITH P.SCROUR / H.T.SCRUB OPTION [Soil sensed in Interval 42]	NOTE 14B	95:00 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
HIGH SOIL [Soil sensed in Interval 42]	NOTE 1A	95:00 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
LOW SOIL (or Non-Sensor Model) H.T.SCRUB OPTION [No soil sensed in Interval 42]	NOTE 14B	87:25 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
LOW SOIL (or Non-Sensor Model) [No soil sensed in Interval 42]	NOTE 1A	87:25 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
LOW SOIL (or Non-Sensor Model) [No soil sensed in Interval 42] — E. STAR MODEL	NOTE 1A	78:20 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
CHINA/LIGHT	NOTES 1A,10,16							
INTERVAL TIME (min:sec)								
HIGH SOIL [Soil sensed in Interval 42]	NOTE 1A	78:25 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
LOW SOIL (or Non-Sensor Model) [No soil sensed in Interval 42]	NOTE 1A	70:20 w/o Th.Holds						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
QUICK CLEANUP / TIME SAVER	NOTES 1B,11,16							
INTERVAL TIME (min:sec)								
COOL FIRST FILL [Sensed inlet water <135F in Interval 45]	NOTE 1B	47:35						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
HOT FIRST FILL [Sensed inlet water >135F in Interval 45]	NOTE 1B	43:55						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
RINSE ONLY	NOTE 1C							
INTERVAL TIME (min:sec)								
ALL MODELS & CONDITIONS (No cycle changes based on sensor inputs)	NOTE 1C	9:45						
NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)								
RINSE ONLY* CYCLE PROGRESSION & STATUS INDICATORS [All other prog/status LED's off]								
SOAKING/SENSING	NOTE 7							
CIRC (PROG BAR R2) (This LED will be labeled as 'WASHING' on models that use it, but it is on during all Wash and Rinse Periods)								
RINSING								
*CYCLE PROGRESSION & STATUS INDICATORS								
PROG BAR W1								
PROG BAR W2								
WASHING (PROG BAR W3)								
PROG BAR R1								
CIRC (PROG BAR R2) (This LED will be labeled as 'WASHING' on models that use it, but it is on during all Wash and Rinse Periods)								
RINSING								
DRYING								
SOAKING	NOTE 7							
SOAKING/SENSING	NOTE 7							
ADD-A-DISH								
WATER HEATING (THERMAL HOLD INDICATOR)	NOTE 6							
SANITIZED	NOTE 8,15							
CLEAN	NOTE 8							
OUTPUT LOADS								
WASH MOTOR (MAIN WINDING)								
DRAIN MOTOR	NOTE 2							
FILL	NOTE 2							
APF ENABLED INTERVALS -Max # of APF Purges allowed in Interval	NOTE 2							
DETERGENT / RINSE AID DISPENSER								
VENT								
HEATER	NOTES 4,10,11,16							

1	3
14	14
11	11
2	2

NOTES

4	3	9
---	---	---

14

2 | 2

NOTES

3	9	4
15		
11	11	11
NOTES		

NOTES

NOTES

HOW TO USE THE COMMON CYCLE TIME CHART

The Common Cycle Time Chart reproduced on pages 26 and 27 of this Job Aid can be found on the Tech Sheet supplied with each dishwasher. The Tech Sheet is located behind the access panel at the bottom of the unit.

The Common Cycle Time Chart appears to be more complex than a typical Esterline Chart. This is a result of the greatly expanded number of cycles and cycle variations possible with electronic controls as opposed to previous electro-mechanical controls. The chart reflects all possible cycles/cycle variations available on ALL Year 2000 Dishwasher models. As a result the chart may list some cycles that will not apply to the specific model being serviced.

Common Cycle Time Chart Layout

The wash cycles are listed on the left side of the chart. Cycle names such as Anti-Bacterial/Baked-On-Cookware may be designated as Anti-Bacterial on some models and Baked-On-Cookware on others. Cycle variations are listed directly underneath each cycle name. These variations are dependent on one or more of the following factors:

- What, if any, options were chosen?
- The Soil Sensor detected soil in the water. (**NOTE:** If the Soil Sensor does not trip during a particular cycle, the unit defaults to the same variation of the cycle that is applicable for non-sensor models.)

The grey highlighted cycle variations indicate options the customer can select (Notes 1 & 3, pages 31 & 32). The grey highlighted cycle variation Light Soil - ENERGY STAR is an exception and indicates a unique default cycle for these models (Note 5, page 33). The unhighlighted cycle variations are based on input from the soil sensor or are defaults based on specific models (Notes 2 & 4, page 32).

Cycle Name	NORMAL	NOTES
	INTERVAL TIME (min:sec)	
Note 1	HEAVY SOIL WITH P.SCOUR / H.T.SCRUB OPTION [Soil sensed in Interval 42]	NOTE 14B 95:00 w/o Th.Holds
Note 2	HEAVY SOIL [Soil sensed in Interval 42]	NOTE 1A 95:00 w/o Th.Holds
Note 3	LIGHT SOIL (or Non-Sensor Model) H.T.SCRUB OPTION [No soil sensed in Interval 42]	NOTE 14B 87:25 w/o Th.Holds
Note 4	LIGHT SOIL (or Non-Sensor Model) [No soil sensed in Interval 42]	NOTE 1A 87:25 w/o Th.Holds
Note 5	LIGHT SOIL (or Non-Sensor Model) [No soil sensed in Interval 42] — E. STAR MODEL	NOTE 1A 78:20 w/o Th.Holds
	NUMERIC DISPLAY CYCLE TIME (spinning "CLOCK" pattern in INTERVALS 45-42 for some models, see NOTE 5)	

Fig. 4-1

Note 1 - Customer Selected Option, Heavy Soils Sensed

Note 2 - No Option Selected, Heavy Soils Sensed

Note 3 - Customer Selected Option, Cycle Adjusted/Shortened because no soils were sensed. Cycle variation may be same as Non-Sensor models.

Note 4 - No Option Selected, Cycle Adjusted/Shortened because no soils were sensed. Cycle variation may be same as Non-Sensor models.

Note 5 - No Option Selected, Cycle Adjusted/Shortened because no soils were sensed. Cycle variation is unique to Energy Star models.

Notes further explain
Cycle/Variation
Function

Cycle Duration
NOT
Including
Thermal Holds



During Soil Sensing function (Interval 42), the LED display will show two dashes. Clock countdown will begin once the cycle variation has been determined.

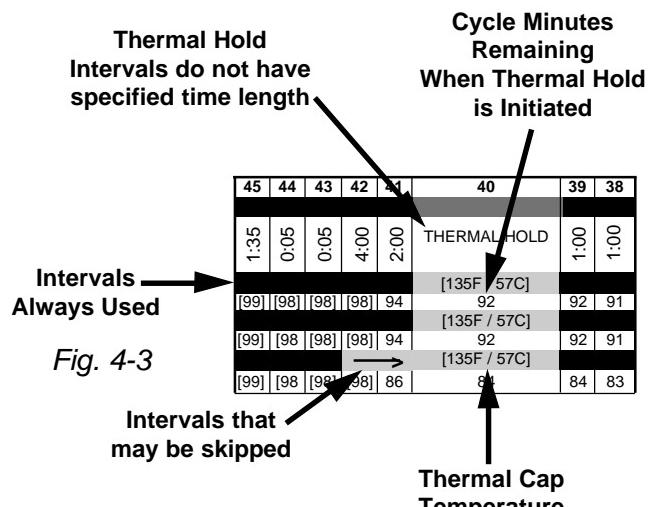
There are 45 intervals in the Common Cycle Time Chart. Not all intervals have the same time assignments from cycle to cycle. An interval may be only seconds long or up to 20 minutes in length. More than one function can take place during an interval. The display LED will show the time remaining in the cycle. (Fig. 4-2)

Thermal holds may be longer (See Note 2, page 32). Thermal Hold intervals do not show specific time lengths. The length of these intervals is determined by input from the thermistor. (Fig. 4-3) If the thermal cap temperature is not reached in a predetermined length of time, the electronic control will proceed to the next interval.

In the same row as the Cycle Name, the shaded bars indicate all possible intervals that may be used in that cycle. Black bars indicate intervals always used. Grey bars with arrows indicate intervals that may be skipped depending on cycle and options chosen. Shaded bars without arrows indicate that the heater may or may not be invoked during thermal holds. (NOTE: During APF and drain functions the heater is turned off. This is a UL requirement and is built into the electronic control programming. See Note 2, page 32) Blank intervals are never used. (Fig. 4-3)

Intervals	45	44	43	42	41	40	39	38
Length of Interval	1:35	0:05	0:05	4:00	2:00	THERMAL HOLD	1:00	1:00
Time Remaining in Display	[99]	[98]	[98]	[98]	[94]	[135F / 57C]	92	91
	[99]	[98]	[98]	[98]	[94]	[135F / 57C]	92	91
	[99]	[98]	[98]	[98]	[86]	[135F / 57C]	84	83

Fig. 4-2



Quick Clean/Time Saver Cycle

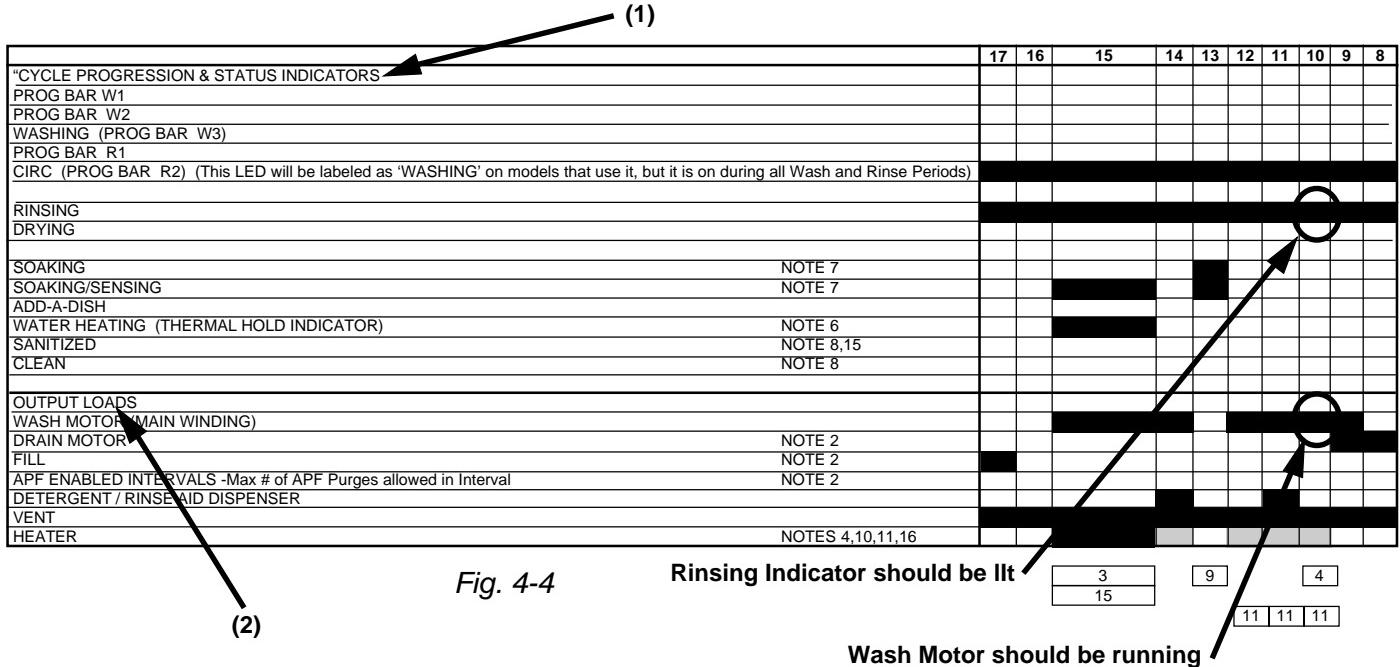
The Quick Clean/Timer Saver cycle has a unique variation. During the initial water fill, the thermistor will monitor the incoming water temperature. If it is 135° F (57° C) or above the electronic control will skip intervals 39 through 36. This shortens the wash/rinse time by eliminating a drain and fill sequence (See Note 1b and 1c, page 31).

Reading the Common Cycle Time Chart

The following information must be determined before the Common Cycle Time Chart can be used:

- What option, if any, was chosen? (For example: Hi-Temp Scrub)
- Is the Dishwasher a Soil Sensor Model?
- If Soil Sensor Model, did the soils in the water trigger the sensor?
- ON QUICK CLEANUP Cycle: Was the first fill water temperature cool or hot?

With this information in hand, the illumination of status indicators and the operation of functional components can be verified by looking at the Cycle Progression and Status Indicators **(1)** and Output Loads **(2)** portion of the chart. (Example: In Interval 10 (Final Rinse) the wash motor interval (Output Loads) is shaded and the Rinse Indicator (Status Indicators) is shaded. This means that the wash motor should be running and the Rinse LED on the control panel should be lit. (Fig. 4-4)



Using the Common Cycle Time Chart

To confirm the correct operation of a cycle or properly diagnosis a malfunction, the following information must be determined:

- Does the model have a Soil Sensor?
- What cycle was chosen?
- What Cycle Option was chosen?
- What is the first fill water temperature? (Quick Clean / Time Saver Cycle only)

Proceed with the following steps:

1. Start the selected cycle and program the unit for Rapid Advance service feature. (See page 36).
2. Advance through the intervals to the one that will operate the load or perform the function to be checked.
3. If the load does not operate, refer to the wiring diagram or applicable strip circuit to determine what connections and components to check. (See Section Five - TECH TIPS.)
4. Whenever possible, check components for resistance or continuity. On components where resistance or continuity checks are not reliable, conduct voltage checks.

COMMON CYCLE TIME CHART NOTES

NOTE 1 – CYCLE MODIFICATIONS BASED ON SENSOR INPUTS

The control monitors food soil and temperature sensors during the first four intervals of the cycle (intervals 45-42) to determine what sensor based cycle modifications are appropriate. The modifications made to the cycle depend on the cycle and options selected as well as the sensor inputs. Note the interval skip arrows and thermal hold temperature changes on the time chart for each version of the cycle.

In addition to being able to modify the cycle itself based on soil sensor input, the APF (Automatic Purge Filtration) wash system allows the control to continuously filter and flush food soil out of the pump during “APF enabled” intervals scattered throughout each cycle and do it without interrupting the cycle (see note 2 on APF).

(a) Anti-Bacterial/Cookware, Pots&Pans/Heavy, Normal, and China Cycles

The control assumes that the worst case cycle (the heavy soil version) is going to be required until the true soil level is determined. The soil level is determined by counting the number of pressure switch (soil sensor) trips that occur in the first APF interval of the cycle (interval 42). If no trips are detected in interval 42, the control modifies the remainder of the cycle to match the light soil/non-sensor version of the cycle. If one or more trips are detected in interval 42, the control continues with the heavy soil version of the cycle.

Note: Energy Star models have a different light soil/non-sensor version of the Normal cycle than other models (see Model Specifics table to identify Energy Star models).

Note: Models without pressure switches (soil sensors) never get sensor trips and thus always default to the light/non-sensor version of the cycle and never execute APF purges. (See Model Specifics Table to identify models without pressure switches).

Note: The Power Scour/High Temp Scrub option can override or alter the soil-based cycle modifications (see Note 14, page 34).

(b) Time Saver/Quick CleanUp Cycles

The control does NOT modify the Quick Clean Up/Time Saver cycle based on soil level. Instead, it modifies the cycle based on incoming water temperature detected during the first fill interval of the cycle (interval 45). The control assumes the worst case cycle (Cool First Fill version) will be required until the end of interval 42. At the end of interval 42, it modifies the remainder of the cycle based on the inlet water temperature it actually detected in the first fill. If the water was more than 135°F/57°C it changes to the “Hot First Fill” version of the cycle. If the water was less than 135°F, it will continue with the “Cool First Fill” version of the cycle. The “Cool First Fill” version of the cycle basically contains an extra drain and fill prior to the main wash to increase the initial water temperature for the main wash and reduce the time needed to heat the water.

Like other cycles, the Quick CleanUp/Time Saver cycle does allow APF purges to occur (in APF intervals) if pressure switch trips occur but the Quick CleanUp/Time Saver cycle timing itself is not modified based on pressure switch trips or soil level.

(c) Rinse Only/Quick Rinse Cycles

The control does NOT modify the Rinse Only/Quick Rinse cycle based on sensor inputs. Like other cycles, it does allow APF purges to occur (in APF intervals) if pressure switch trips occur but the Rinse Only/Quick Rinse cycle timing itself is not modified based on any sensor inputs.

NOTE 2 – APF ENABLED INTERVALS

The APF (Automatic Purge Filtration) wash system allows the control to continuously filter and flush food soil out of the pump during “APF enabled” intervals scattered throughout each cycle and do it without interrupting the cycle. The control monitors the pressure switch (soil sensor) input during each of the APF enabled intervals in the cycle (see time chart). Whenever a pressure switch trip is detected in one of these APF intervals, the control executes a 10-second “APF purge” to clear the pump of soil. These APF purges occur in parallel with the cycle and do not interrupt or affect the timing of other functions (like washing) that are called for in the interval. Each APF purge consists of 5 seconds of Fill and Drain followed immediately by 5 seconds of Fill by itself. If an APF purge is executed during a heated wash interval, the heater must be turned off during the first 5-second Fill and Drain portion of each purge, but cycle timing is not affected and the heater turns back on mid-way through the purge.

Multiple APF purges can occur within each APF interval of the cycle but are limited by certain frequency and quantity limits:

- APF purges must be spaced at least 60 seconds apart within any given APF interval (the pressure switch will be ignored prior to 60 seconds).
- The maximum number of APF purges allowed within a given APF interval is specified on the time chart in that interval (the pressure switch will be ignored for the duration of an APF interval once the maximum APF limit for that interval has been exceeded). In interval 33, the limit is “1” for 120°F thermal holds and “3” for all other thermal hold setpoint temperatures.

Note: Models without pressure switches (soil sensors) never get sensor trips and thus never execute APF purges. (See Model Specifics Table to identify models without pressure switches).

NOTE 3 – WATER HEATING THERMAL HOLD INTERVALS

During water heating thermal holds (intervals 40, 33, & 15), cycle timing is interrupted and the dishwasher continues washing while it heats the water to the setpoint temperatures specified on the time chart for each version of the cycle. The Water Heating and Sensing indicators are turned on and the cycle time displayed by models with numeric displays is frozen during thermal hold intervals (see Notes 5, 6, & 7). The dishwasher will hold in this suspended, water heating mode until the water reaches the temperature specified for the thermal hold or a maximum default time limit for the thermal hold (below) expires. At the conclusion of the thermal hold, the control resumes normal operation and timing and proceeds to the next interval.

The default maximum time limits for all the thermal hold intervals are as follows (in minutes):

	Pre-Wash	Main Wash	Final Rinse	(Final Rinse with Sani Rinse)
Anti-Bacterial/Cookware	30	35	50	(50)
Pots & Pans/Heavy	30	35	30	(50)
Normal	—	45	40	(60)
China	—	45	30	(—)

(Quick CleanUp/Time Saver and Quick Rinse/Rinse Only cycles have no thermal hold intervals)

NOTE 4 – THERMALLY CAPPED INTERVALS

Interval 34 is a heated wash interval thermally capped at 150°F/66°C. Interval 10 is only heated for the Quick CleanUp/Time Saver cycle and is thermally capped in that situation at 150°F/66°C. Anytime the thermal cap temperature is exceeded during one of these intervals, the heater will turn off, but the dishwasher will continue washing for the duration of the interval.

NOTE 5 - NUMERIC CYCLE TIME DISPLAY

Some models with numeric cycle time displays show an animated spinning clock pattern during the first four intervals of the cycle (intervals 45-42) while sensor based cycle modifications (and true time remaining) are being determined. Other models simply display the worst case cycle time remaining (in minutes) until the end of interval 42. See the Model Specifics Table to identify models with numeric displays and which models exhibit the animated clock pattern. At the end of interval 42, all models with numeric displays will begin displaying a corrected cycle time (in minutes). From here on, the display clocks down normally, minute by minute, through the rest of the cycle.

Note: Cycle time does not include time spent in thermal holds; the time on the display at the start of the thermal hold is frozen until the end of the thermal hold (see Notes 3 & 6).

NOTE 6 – WATER HEATING (THERMAL HOLD) STATUS INDICATOR

The Water Heating indicator is turned on during all thermal hold intervals to signal that cycle timing, display sequencing, and numeric cycle time display countdown operations have been suspended or frozen while the water is heated to the proper temperature (see Note 3).

NOTE 7 – SOAKING/SENSING & SOAKING STATUS INDICATORS

In general, the Soaking/Sensing indicator is primarily a “sensing” indicator and is turned on during cycles whenever the control is monitoring sensors or still making decisions based on sensor inputs. Specifically this includes all APF intervals, all thermal hold intervals, and the first four intervals of each cycle (see Notes 1, 2, and 3).

The Soaking/Sensing indicator also turns on during “soaking” events like the “soaking/pause” intervals in the Energy Star low soil/non-sensor version of the Normal cycle (see Note 9). A dedicated Soaking indicator is available for non-numeric models that will likewise turn on during these “soaking” events but not during “sensing” intervals.

NOTE 8 – ‘END-OF-CYCLE’ STATUS INDICATORS – CLEAN and SANITIZED

Both end-of-cycle indicators (Clean and Sanitized) turn on at the end of a cycle and turn off upon pressing any key or opening and closing the door (Note: The indicators stay on as the door is opened but turn off as soon as the door is closed again).

(a) Clean

Comes on at the end of every cycle except Rinse Only/Quick Rinse.

(b) Sanitized

Comes on at the end of all cycles completed with the Sani Rinse option selected (see Note 15). If the Sani Rinse option is completed successfully, the indicator is turned on steady at the end of the cycle. If the Sani Rinse was unsuccessful (see below), the indicator will flash $\frac{1}{2}$ second on, $\frac{1}{2}$ second off, repeatedly, at the end of the cycle. The Sani Rinse will be deemed unsuccessful (& flash the indicator) if:

- (1) The thermal hold in the final rinse (interval 15) fails to reach the required 160°F/71°C before timing out on its default time limit.
- (2) The door is opened and/or power is interrupted between the end of the final rinse thermal hold (interval 15) and the end of the cycle.

NOTE 9 - SOAKING PAUSE INTERVAL — ENERGY STAR NORMAL CYCLE ONLY

Intervals 13 and 32 are mid-cycle soaking/pause intervals and are only used in the Energy Star light soil/non-sensor version of the Normal cycle. The control stops washing and turns all loads off except the vent in these intervals. The intent is to let the wash water that's on the dishes soften and loosen the food soil that's on the dishes, energy free. The Soaking and Soaking/Sensing indicators are turned on during these intervals (see Note 7).

NOTE 10 – PULSED DRY — CHINA CYCLE ONLY

The China cycle (on all models) turns the heater off in intervals 1, 3, and 5 of the dry period to create a gentler “pulsed” dry.

NOTE 11 – HEATER ON — QUICK CLEANUP/TIME SAVER CYCLE ONLY

To make up for no water heating thermal holds, the heater is turned on in intervals 10-12, 14, and 41-42 of the Quick CleanUp/Time Saver cycle. The heater in interval 10 of the Quick CleanUp/Time Saver cycle is thermally capped at 150°F/66°C (see Note 4).

NOTE 14 – POWER SCOUR/HIGH TEMP SCRUB OPTION

The Power Scour/High Temp Scrub option is not allowed with China, Quick CleanUp/Time Saver, or Rinse Only/Quick Rinse cycles. This option does the following:

- (a) Anti-Bacterial/Cookware and Pots&Pans/Heavy cycles
 - Forces the control to run no less than a 5-fill (Wash-Wash-Rinse-Rinse-Dry) version of the cycle, even if no soil is sensed.
 - Raises the pre-wash water heating thermal hold (interval 40) to 135°F/57°C
 - Raises the main wash water heating thermal hold (interval 33) to 145°F/63°C (except Anti-Bacterial/Cookware cycle, which is already 145°F/63°C).
- (b) Normal cycles
 - Forces the control to run no less than a 4-fill (Wash-Wash-Rinse-Rinse-Dry) version of the cycle even if no soil is sensed. Note: The standard (non-Energy Star) Normal cycle is already a minimum of 4-fills (Wash-Wash-Rinse-Rinse-Dry) with light/no soil.
 - Raises the main wash water heating thermal hold (interval 33) to 145°F/63°C.

NOTE 15 – SANI RINSE OPTION

The Sani Rinse option is not allowed on China, Quick CleanUp/Time Saver, and Rinse Only/Quick Rinse cycles. It is “built in” and treated as an automatic option on the Anti-Bacterial/Cookware cycles. This option does the following:

- Raises final rinse water heating thermal hold (interval 15) to 160°F/71°C and adds 20 minutes to its default maximum time limit.
- Turns heater off in the last two intervals of the dry period (intervals 1 and 2).
- Invokes the Sanitized status indicator at the end of the cycle (see Note 8).

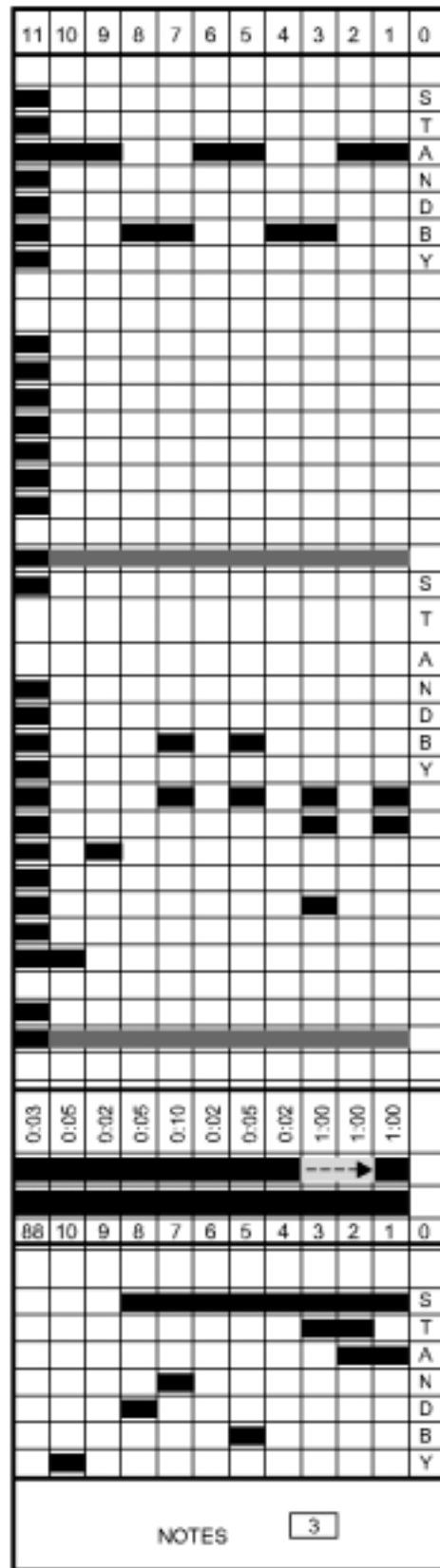
NOTE 16 – AIR DRY/NO HEAT DRY/ENERGY SAVER DRY OPTION

The Air Dry/No Heat Dry option is not allowed on the Rinse Only/Quick Rinse cycle (which has no dry). This option does the following:

- Turns heater off in the dry period (intervals 1-6).

Diagnostic Cycle Time Chart

INTERVAL											
CYCLE LED's											
ANTIBACTERIA / COOKWARE											
POTS&PANS / HEAVY											
NORMAL											
CHINA/LIGHT											
QUICK WASH / QUICK CLEANUP / TIME SAVER											
RINSE ONLY / QUICK RINSE											
CANCEL DRAIN											
OPTION LED's											
H.T. SCOUR / H.T. SCRUB											
SOAK&SCOUR											
NO HEAT DRY / AIR DRY/ E.SVR.DRY											
SANI RINSE											
DELAY - 2 HR											
DELAY - 4 HR											
DELAY - 8 HR											
RINSE AID EMPTY											
LOCKOUT											
CYCLE PROG/STATUS LED's											
W1											
W2											
WASHING (W3)											
R1											
WASHING/RINSING (R2) [labeled 'WASHING' on models w/o Rinsing LED's]											
RINSING											
DRYING											
SOAKING											
SOAKING/SENSING											
ADD-A-DISH											
WATER HEATING											
SANITIZED											
CLEAN											
INTERVAL TIME (min:sec)											
DIAG. CYCLE (P.Switch Closed)											
DIAG. CYCLE (P.Switch Open)											
NUMERIC DISPLAY (DISPLAYS INTERVAL NUMBER)											
OUTPUT LOADS											
VENT											
WASH MOTOR MAIN											
DRAIN MOTOR											
FILL VALVE											
UNDEFINED EXTRA OUTPUT											
DET-R/A DISPENSER											
HEATER											



RAPID ADVANCE SERVICE FEATURE AND DIAGNOSTICS CYCLES

Pressing the following option keys in the sequence shown will either start the Diagnostics Cycle or turn on the Rapid Advance feature for stepping through customer selectable cycles:

**HIGH TEMP SCRUB, AIR DRY, HIGH TEMP SCRUB, AIR DRY
Or
SANI RINSE, AIR DRY, SANI RINSE, AIR DRY**

(Note: HIGH TEMP SCRUB = POWER SCOUR = HIGH TEMP SCOUR)

(Note: AIR DRY = NO HEAT DRY = ENERGY SAVER DRY)

If *the above key sequence is entered after starting a cycle*, the Rapid Advance feature is turned on, which allows the operator to manually advance the currently running cycle, interval by interval, by pressing the Pots&Pans/Heavy or Anti-Bacterial/Cookware or Start key.

If *the above key sequence is entered with the dishwasher in Standby*, the Diagnostics Cycle is started. The Diagnostics Cycle can be rapid-advanced, interval by interval, by pressing the Pots & Pans/Heavy or Anti-Bacterial/Cookware or Start key.

NOTE: The door must be closed before the Diagnostics cycle will run. Likewise, the door must be closed after each rapid advance selection of the Pots & Pans/Heavy or Anti-Bacterial/Baked On Cookware key for the control to advance to the next interval of the Diagnostics or currently running cycle.

DIAGNOSTICS CYCLE TIME CHART NOTES

(DIAGNOSTICS CYCLE) NOTE 1 – R/A SENSOR ASSY CHECK

To help detect a defective or disconnected Rinse Aid level sensor, the Rinse Aid Empty LED should light up in Diagnostics if the Rinse Aid dispenser is empty or the circuit is shorted. If the Rinse Aid dispenser is full, the LED indicator will not light up during the diagnostic test, except in the first increment.

(DIAGNOSTICS CYCLE) NOTE 2 – THERMISTOR OPEN/SHORT DETECTION

The Diagnostics Test cycle will illuminate the ‘CLEAN’ LED throughout the operating portion of the cycle that follows the initial display test interval whenever it detects a “short circuit” or “open circuit” on the thermistor input.

NOTE: Warm water must be in the dishwasher when performing this test. The highest thermistor resistance values the control can detect as its open circuit criteria are close to the normal thermistor resistances at room temperature. Consequently, this indicator is only reliable for “open circuit” detection if warm water is in the dishwasher.

(DIAGNOSTICS CYCLE) NOTE 3 – STUCK PRESSURE SWITCH DETECTION

The Diagnostics cycle monitors the normally open soil-sensing pressure switch input for a “stuck closed” condition by aborting wash interval 3 and skipping immediately to drain interval 1 if the control detects a closed pressure switch.

SECTION FIVE

TECH TIPS

WIRING DIAGRAM

Stainless Steel Tub Wiring Diagram

Plastic Tub Wiring Diagram

SCHEMATIC SHOWN WITH DOOR SWITCH & ALL OTHER NORMALLY OPEN CONTACTS OPEN.

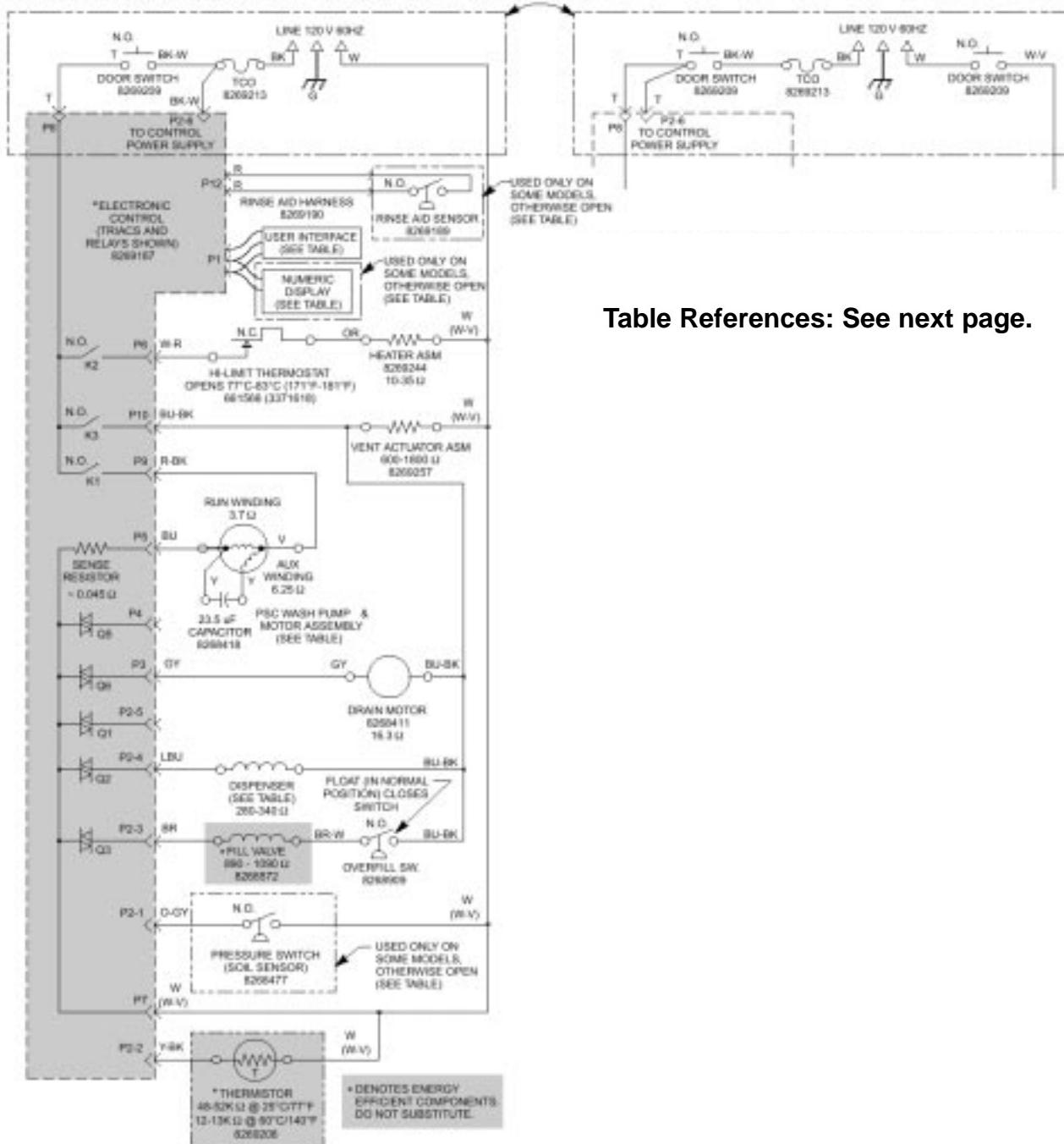


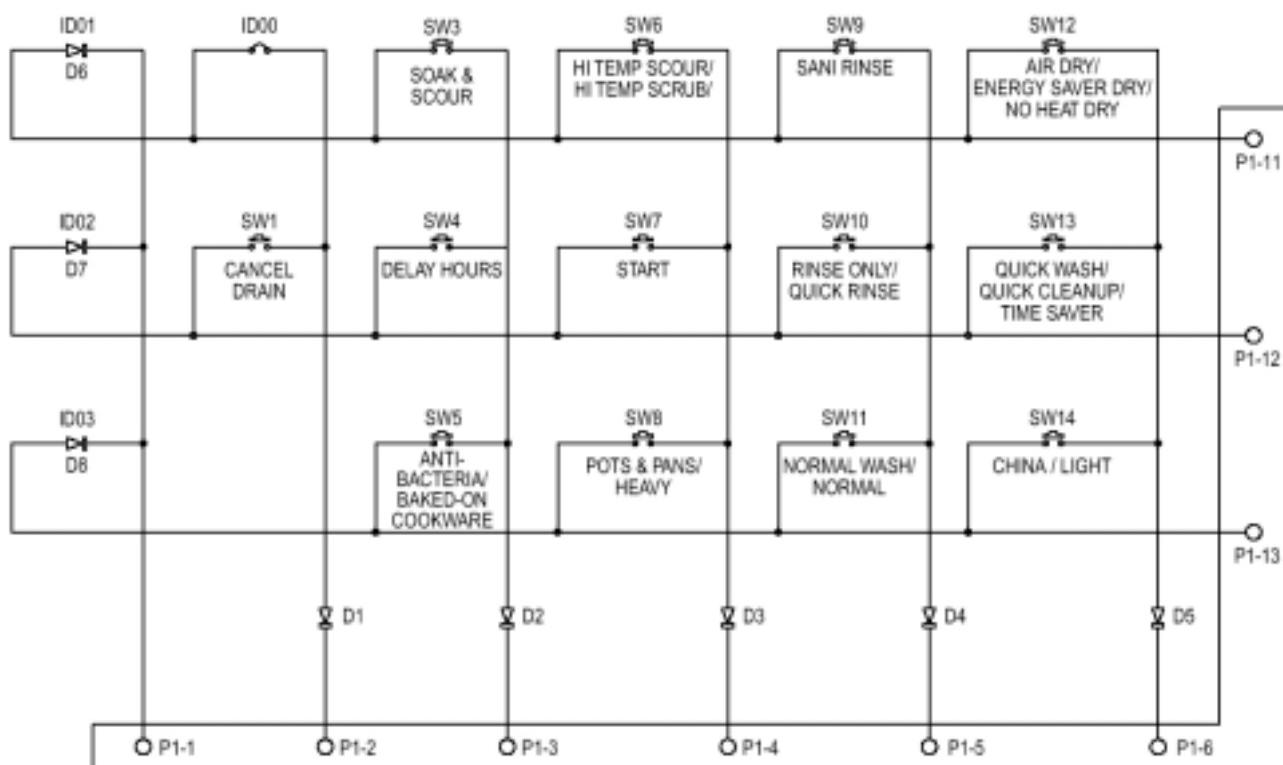
Table References: See next page.

MODEL SPECIFIC SERVICE PARTS TABLE

MODEL NUMBER	MODEL SPECIFICS TABLE											
	REFERENCE ENERGY STAR	SPINNING CLOCK	USER INTERFACE	JUMPER TAILS	INTERCONNECT CARD	NUMERIC DISPLAY	PUMP & MOTOR ASSEMBLY	PRESSURE SWITCH	DISPENSER	RINSE AID SENSOR	RINSE AID HARNESS	WIRING HARNESS
16856 (DHW)	NO	YES	6269737 (TOP) 6269738 (FRONT)	6269739	6269207				6269121	6269189	6269190	6269131
16856 (DHW)			6269429				6269422	6269477				
16856 (DW1-S)			6269639		N/A	6269208						
16856 (DWH1)			6269627		N/A							
16856 (DFTW)			6269620				6269113		6271032	N/A	N/A	
15874 (DFEW)			6269625		N/A						6269134	
KU17501FE	YES	NO	6271030	6271047	N/A	N/A			N/A	N/A		
KU20211DU			6269030 14 6269421 (TOP) 6269601 (FRONT)	6269602	6269207	6269208	6269477		6269189	6269190		
KU17501LU			6269130								6269131	
KUDR91TJ			6269130	N/A								
KUDR91TJ			6270250									
KUDM91FK			6270108	6270447	N/A	N/A			N/A	N/A		
KUDM91FJ			6269137									
KUDR91TJ			6271034		N/A							
KUDR91TJ			6269136									
GU9000	YES	NO	6269030			6269008	6269482		6269021		6269131	
GU1500			6269331	N/A	N/A	6269413	6269477	6270034	6269189	6269190	6269739	
GU1200			6269332									

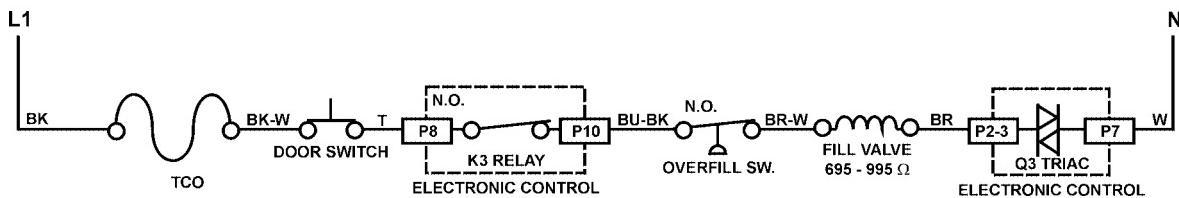
USER INTERFACE SWITCH MATRIX

(NOTE: Switches may not appear on all models, IDs vary by model.)

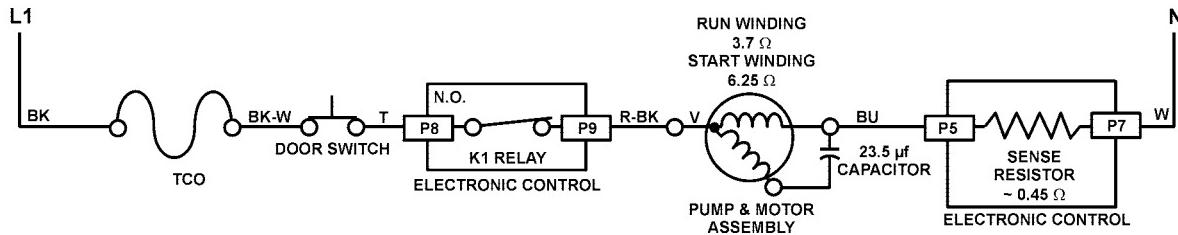


STRIP CIRCUITS

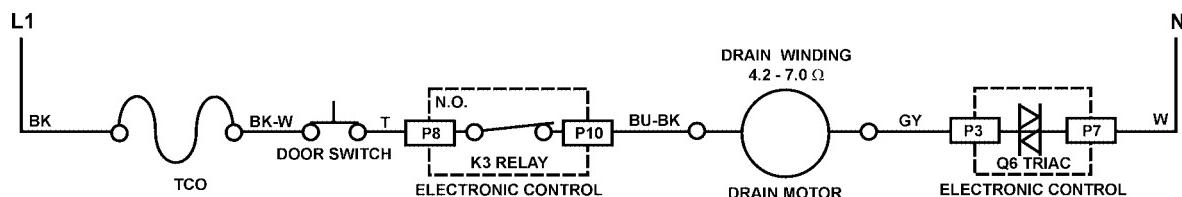
FILL



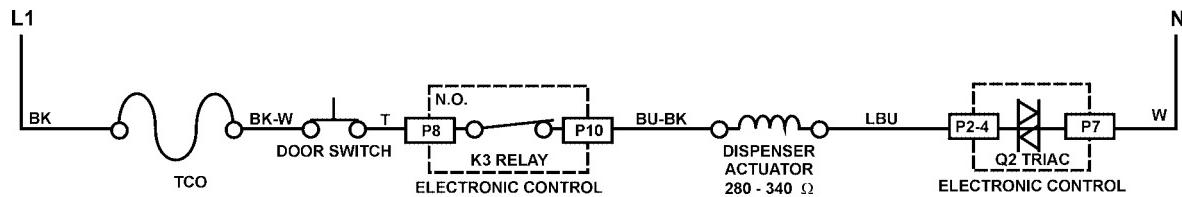
WASH/RINSE



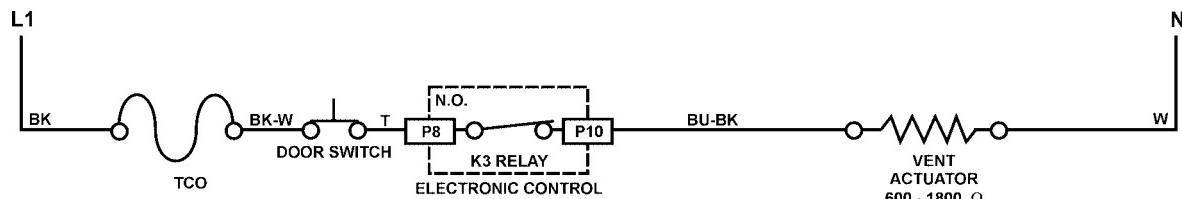
DRAIN



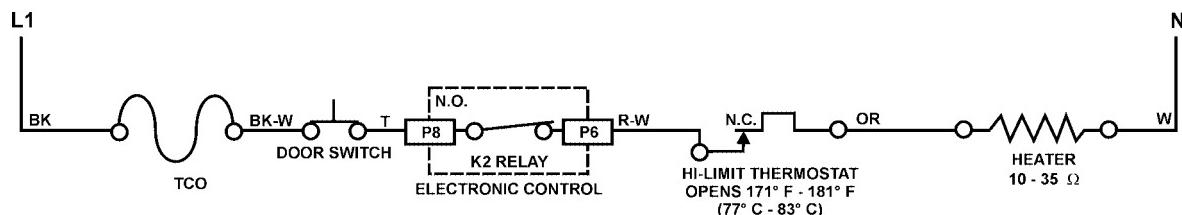
DISPENSER



VENT

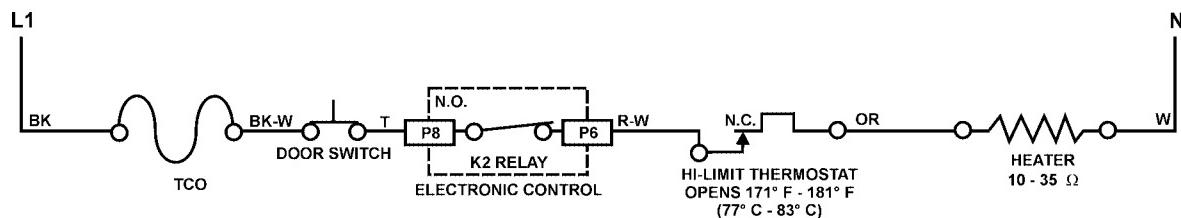


HEAT DRY

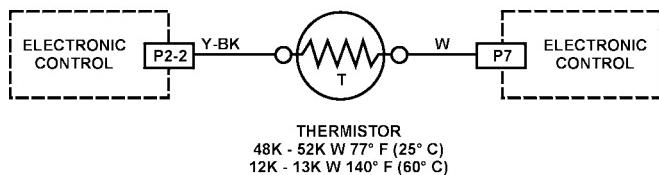


WATER HEATING

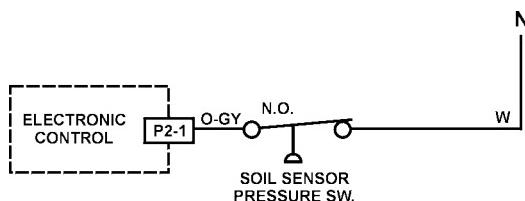
Heater Circuit



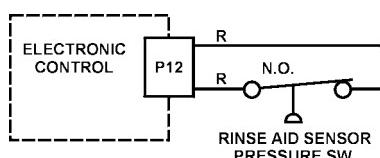
Thermistor



SOIL SENSING



RINSE AID SENSING



ELECTRONIC CONTROL CONNECTOR PINS

PIN NO.	DESCRIPTION	WIRE COLOR
P1	RIBBON CABLE TO USER INTERFACE	-
P2-1	PRESSURE SWITCH (SOIL SENSE)	O-GY
P2-2	THERMISTOR	Y-BK
P2-3	FILL VALVE	BR
P2-4	DISPENSER	LBU
P2-5	OPEN	O-BK
P2-6	TO CONTROL POWER SUPPLY	T
P3	DRAIN MOTOR	GY
P4	WASH MOTOR AUX WINDING	Y
P5	WASH MOTOR RUN WINDING	BU
P6	SWITCHED L1 TO HEATER	W-R
P7	AC NEUTRAL	W-V
P8	SWITCHED L1 FROM TCO	T
P9	SWITCHED L1 TO WASH MOTOR COMMON	R-BK
P10	SWITCHED L1 TO VENT, FILL VALVE, DISPENSER & PRESSURE SWITCH	BU-BK
P12	OPTIONAL RINSE AID	R

**PRODUCT SPECIFICATIONS
AND
WARRANTY INFORMATION SOURCES**

IN THE UNITED STATES:

FOR PRODUCT SPECIFICATIONS AND WARRANTY INFORMATION CALL:

FOR WHIRLPOOL PRODUCTS: 1-800-253-1301
FOR KITCHENAID PRODUCTS: 1-800-422-1230
FOR ROPER PRODUCTS: 1-800-447-6737

FOR TECHNICAL ASSISTANCE WHILE AT THE CUSTOMER'S HOME CALL:

THE TECHNICAL ASSISTANCE LINE: 1-800-253-2870

HAVE YOUR STORE NUMBER READY TO IDENTIFY YOU AS AN AUTHORIZED SERVICER

FOR LITERATURE ORDERS:

PHONE #: 1-800-851-4605

IN CANADA:

FOR PRODUCT SPECIFICATIONS AND WARRANTY INFORMATION CALL:

1-800-461-5681

FOR TECHNICAL ASSISTANCE WHILE AT THE CUSTOMER'S HOME CALL:

THE TECHNICAL ASSISTANCE LINE: 1-800-488-4791

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